



NUMBER	TITLE	SHEETS	
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SA-097	SPECIALWORK MATERIAL LIST	2	
SA-098	MASTER MATERIAL LIST USAGE REFERENCE	4	
SA-099	MASTER MATERIAL LIST	4	
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SA-101	STRAIN PLATE	1	
SA-102	STEEL POLE COLLAR	1	
SA-103	WOOD POLE EYEBOLT ASSEMBLY	1	
SA-104	WOOD POLE DOWN GUY ASSEMBLY	1	
SA-106	COMPRESSION POLE BRACKET POLE COLLAR	1	
SA-107	STAINLESS STEEL EYEBOLT	1	
SA-108	BRACKET ARM POLE END CAP	1	
SA-109	BRACKET ARM ARM END CAP	1	
SA-110	BRACKET ARM SPAN END CAP	1	
SA-111	WOOD POLE MOUNTING BRACKET	1	
SA-112	3 1/2" TUBE SOCKET PLATE	1	
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SA-114	BRACKET ARM POLE END CAP WITH BOTTOM TAB	1	
SPECIAL ASSEMBLIES AND SYSTEM CRITERIA			
SA-151	SPECIALWORK INSULATED JUMPER ASSEMBLY	1	
SA-152	TROLLEY WIRE DEADEND ASSEMBLY	2	
SA-153	STAGING DEADEND ASSEMBLY	1	
DESIGNED A WOLAK	CHKD: D GREER	<div>METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS</div> <div>INDEX</div>	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE		FILE
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APPROVED J DAVIS	CONTRACT NO:		SHT 1 OF 5
			


NUMBER	TITLE	SHEETS
SA-161	SPECIALWORK DEVICE REFERENCE POINT LOCATIONS	1
SA-163	SPECIALWORK SWITCH CONTACTOR CONFIGURATION	1
SA-164	TROLLEY WIRE SUPPORT SPAN ATTACHMENT CRITERIA	4
SA-165	FROG INDUCTION CONTROL SYSTEM	6
SA-166	ADJUSTMENT POINT	1
SA-167	INSULATION COVERED GUY WIRE REQUIREMENT CRITERIA	1
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SA-221	BUILDING EYEBOLT INSTALLATION	5
SA-231	DOWN GUY	1
SA-232	SIDEWALK GUY	2
SA-233	HEAD GUY	1
SA-234	BRACKET ARM GUY	2
DESIGNED A WOLAK	CHKD: D GREER	 King County
DR: B FARISSB	SCALE: NONE	
RECOM.	IBIS NO:	
APPROVED J DAVIS	CONTRACT NO:	
METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS		
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NUMBER	TITLE	SHEETS	
TROLLEY WIRE SUPPORT ASSEMBLIES			
SA-300	TANGENT SPAN TWO-WAY TRAFFIC W/ K& M HANGERS	1	
SA-301	TANGENT SPAN TWO-WAY TRAFFIC	1	
SA-302	HOLDUP TANGENT SPAN TWO-WAY TRAFFIC	1	
SA-303	INVERTED TANGENT SPAN TWO-WAY TRAFFIC	1	
SA-304	HOLDDOWN TANGENT SPAN TWO-WAY TRAFFIC	1	
SA-305	BRIDLE TANGENT SPAN TWO-WAY TRAFFIC	2	
SA-306	DOUBLE BRIDLE TANGENT SPAN TWO-WAY TRAFFIC	2	
SA-307	1° TO 5° CURVE SPAN W/ 2' CURVE RAILS TWO-WAY TRAFFIC	2	
SA-308	5.5° TO 7.5° CURVE SPAN W/ 4' CURVE RAILS TWO-WAY TRAFFIC	2	
SA-309	TANGENT SPAN THREE TRACKS	1	
SA-310	8° TO 30° CURVE SPAN W/ CURVE SEGMENTS TWO-WAY TRAFFIC	2	
SA-311	TANGENT SPAN ONE-WAY TRAFFIC	1	
SA-312	HOLDUP TANGENT SPAN ONE-WAY TRAFFIC	1	
SA-313	INVERTED TANGENT SPAN ONE-WAY TRAFFIC	1	
SA-314	HOLDDOWN TANGENT SPAN ONE-WAY TRAFFIC	1	
SA-315	BRIDLE TANGENT SPAN ONE-WAY TRAFFIC	2	
SA-316	DOUBLE BRIDLE TANGENT SPAN ONE-WAY TRAFFIC	2	
SA-317	1° TO 5° CURVE SPAN W/ 2' CURVE RAILS ONE-WAY TRAFFIC	2	
SA-318	5.5° TO 7.5° CURVE SPAN W/ 4' CURVE RAILS ONE-WAY TRAFFIC	1	
SA-320	8° TO 30° CURVE SPAN W/ CURVE SEGMENT ONE-WAY TRAFFIC	2	
SA-321	DOUBLE FEEDER SPAN TWO-WAY TRAFFIC	3	
DESIGNED A WOLAK	CHKD: D GREER	<div>METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS</div> <div>INDEX</div>	DATE: APRIL 2008
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NUMBER	TITLE	SHEETS
SA-322	SINGLE FEEDER SPAN TWO-WAY TRAFFIC	2
SA-325	EQUALIZER SPAN TWO-WAY TRAFFIC	1
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SA-332	SINGLE FEEDER SPAN ONE-WAY TRAFFIC	2
SA-333	SECTIONALIZING SPAN ONE-WAY TRAFFIC	1
SA-334	TROLLEY WIRE SPREADER BAR	1
SA-341	STEEL POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	2
SA-342	STEEL POLE BRACKET ASSEMBLY CURVE CONSTRUCTION	2
SA-343	STEEL POLE BRACKET ASSEMBLY COMPRESSION TYPE	4
SA-345	STEEL POLE BRACKET ASSEMBLY UNDERSLING CONSTRUCTION	2
SA-348	STEEL POLE HOLDDOWN BRACKET ASSEMBLY	2
SA-349	STEEL POLE TANGENT FEEDER BRACKET ASSEMBLY	3
SA-351	WOOD POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	2
SA-352	WOOD POLE BRACKET ASSEMBLY CURVE CONSTRUCTION	2
SA-355	WOOD POLE BRACKET ASSEMBLY UNDERSLING CONSTRUCTION	2
SA-358	WOOD POLE HOLDDOWN BRACKET ASSEMBLY TANGENT CONST	2
SA-361	TRAFFIC MAST ARM TROLLEY SUPPORT	1
SA-370	SPAN WIRES LIMITED SPACE TYPICAL VARIANCES	2
SA-371	SWITCH & CURVE SEGMENT PULLOFFS	9
SA-372	CROSSOVER HOLDUP SPAN	2
SA-373	CONVENTIONAL CURVE WITH CURVE RAILS	4

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS INDEX	DATE: APRIL 2008
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NUMBER	TITLE		SHEETS	
SPECIAL DETAILS				
SA-401	LIGHTNING ARRESTERS AT FEEDER RISER POLES		6	
SA-402	FEEDER RISER POLE		3	
SA-403	STEEL POLE FEEDER RISER WITH STREETLIGHT		1	
SA-411	DUCTBANK CONCRETE ENCASED		2	
PURCHASE REQUIREMENTS				
SP-201	STANDARD STEEL POLE PURCHASE REQUIREMENTS		13	
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE		INDEX	FILE
RECOM.	IBIS NO:			DWG. NO. SA-001
APPROVED J DAVIS	CONTRACT NO:			SHT 5 OF 5


SPECIALWORK MATERIAL LIST						
ITEM #		DESCRIPTION		WABCO CAT. NO.		
1		15° WSE, RH, IC, RS		55964-3001		
2		15° WSE, LH, IC, RS		55964-3002		
3		15° WSE, RH, IC, RC		55964-3005		
4		15° WSE, LH, IC, RC		55964-3006		
5		15° WSE, RH, IS, RS		55973-3001		
6		15° WSE, LH, IS, RS		55973-3002		
7		15° WSE, RH, IS, RC		55973-3003		
8		15° WSE, LH, IS, RC		55973-3004		
9		15° WTR, RH, IC, RC		55979-3001		
10		15° WTR, LH, IC, RC		55979-3002		
11		15° WTR, RH, IC, RS		55979-3005		
12		15° WTR, LH, IC, RS		55979-3006		
13		15° WTR, RH, IS, RC		55981-3001		
14		15° WTR, LH, IS, RC		55981-3002		
15		15° WTR, RH, IS, RS		55981-3003		
16		15° WTR, LH, IS, RS		55981-3004		
17		30° WSE, RH, IC, RS		56425-3001		
18		30° WSE, LH, IC, RS		56425-3002		
19		30° WSE, RH, IC, RC		56425-3003		
20		30° WSE, LH, IC, RC		56425-3004		
21		30° WSE, RH, IS, RS		57143-3001		
22		30° WSE, LH, IS, RS		57143-3002		
23		30° WSE, RH, IS, RC		57143-3003		
24		30° WSE, LH, IS, RC		57143-3004		
25		30° WTR, RH, IS, RC		56596-3005		
26		30° WTR, LH, IS, RC		56596-3006		
27		30° WTR, RH, IS, RS		56596-3007		
28		30° WTR, LH, IS, RS		56596-3008		
29		30° WTR, RH, IC, RC		56597-3001		
30		30° WTR, LH, IC, RC		56597-3002		
31		30° WTR, RH, IC, RS		56597-3005		
32		30° WTR, LH, IC, RS		56597-3006		
33		17° RXO		17872 A OR B		
34		27° RXO		17874 A OR B		
35		30° RXO		55968-3003		
36		37° RXO		17877 A OR B		
37		45° RXO		55967-3003		
38		50° RXO		57857-3007		
39		60° RXO		55966-3001		
40		90° RXO		55965-3001		
41		30°- 60° XOCS, RH		57123-3001		
42		30°- 60° XOCS, LH		57123-3002		
43		30°- 45° XOCS, LH		55969-3001		
DESIGNED A WOLAK		CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS		DATE: APRIL 2008
DR: B FARISSB		SCALE: NONE				FILE
RECOM.		IBIS NO:				DWG. NO. SA-097
APPROVED J DAVIS		CONTRACT NO:		SPECIAL WORK MATERIAL LIST		SHT 1 OF 2


SPECIALWORK MATERIAL LIST		
ITEM #	DESCRIPTION	WABCO CAT. NO.
44	58° TO 65° AXO	18438
45	66° TO 90° AXO	18437
46	15° Y, IND, ILH, RST RH	59503-3004
47	23° WSE, RH, IC, RS	55961-3001
48	23° WSE, LH, IC, RS	55961-3002
49	23° WTR, RH, IC, RS	55978-3001
50	23° WTR, LH, IC, RS	55978-3002
51	45° WSE, RH, IC, RS	56593-3001
52	45° WSE, LH, IC, RS	56593-3002
53	45° WSE, RH, IC, RC	56593-3005
54	45° WSE, LH, IC, RC	56593-3006
55	45° WSE, RH, IS, RS	57904-3001
56	45° WSE, LH, IS, RS	57904-3002
57	45° WSE, RH, IS, RC	57904-3005
58	45° WSE, LH, IS, RC	57904-3006
59	45° WTR, RH, IC, RC	56595-3005
60	45° WTR, LH, IC, RC	56595-3006
61	45° WTR, RH, IC, RS	56595-3007
62	45° WTR, LH, IC, RS	56595-3008
63	45° WTR, RH, IS, RC	56592-3005
64	45° WTR, LH, IS, RC	56592-3006
65	45° WTR, RH, IS, RS	56592-3007
66	45° WTR, LH, IS, RS	56592-3008

LEGEND

RH = RIGHT HAND SWITCH
 LH = LEFT HAND SWITCH
 IC = INSULATION IN CURVE
 IS = INSULATION IN STRAIGHT
 WSE = ELECTRICALLY OPERATED INDUCTIVE SWITCH
 WTR = TRAILING SWITCH
 RXO = RIGID CROSSOVER
 RC = RESET TO CURVE
 RS = RESET TO STRAIGHT
 XOCS = CROSSOVER CURVE SEGMENT
 Y = Y SWITCH
 IND = ELECTRICALLY OPERATED INDUCTIVE SWITCH
 ILH = INSULATION IN LH OF Y
 RST RH = RESET TO RH OF Y
 AXO = ADJUSTABLE CROSSOVER

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS SPECIAL WORK MATERIAL LIST	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-097
APPROVED J DAVIS	CONTRACT NO:			SHT 2 OF 2


MASTER MATERIAL LIST					
ITEM #	METRO STANDARD SA— WHICH USES THE ITEM				
01	153,165,190,300,301,302,303,304,305,306,307,309,311,312,313,314,315,316,317,321,322,325,331,332,334,345,348,355,358				
02	190,301,302,305,306,309,311,312,315,316,355,345				
03	152,166,167,233,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,320,321,322,325,331,332,342,343,345,348,352,370,371,372,373,355,358				
04	152,233,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,320,321,322,325,331,332,342,343,345,348,352,370,371,372,373,355,358				
05	152,166,233,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,320,321,322,325,331,332,342,343,345,348,352,370,371,372,373,355,358				
06	152,166,233,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,320,321,322,325,331,332,342,343,345,348,352,370,371,372,373,355,358				
07	152,233,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,320,321,322,325,331,332,342,343,345,348,352,370,371,372,373,355,358				
08	152,166,167,233,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,320,321,322,325,331,332,342,343,345,348,352,370,371,372,373,355,358				
09	152,305,306,310,315,316,331,371,372				
10	153,303,304,307,308,313,314,317,318,334,342,345,348,352,370,373,358				
11	152,310,342,343,345,348,352,371,372,355,358				
12	310,320,322,325,332,342,343,345,352,370,371,373				
13	152,166,167,231,232,233,305,306,315,316,371,373				
14	152,153,231,232,233,305,306,315,316,371,373				
15	166,233,305,306,315,316,341,342,345,348,349,351,352,371,373,355,358				
16	152,166,167,231,232,233,305,306,315,316,371,373				
17	152,153,233,234,305,306,315,316,341,342,345,348,349,351,352,371,373,355,358				
18	167,310,372				
19	167				
20	343				
21	321,322,331,332				
22	321,322,325,331,332				
23	153,321,331				
24	361				
25	310,320,342,352				
26	321,322,331,332				
27	321,322,331,332				
28	341,348,349,351,361,358				
29	333				
30	341,349,351,361				
DESIGNED A WOLAK		CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS	DATE: APRIL 2008
DR: B FARISB		SCALE: NONE			FILE
RECOM.		IBIS NO:			DWG. NO. SA—098
APPROVED J DAVIS		CONTRACT NO:		MASTER MATERIAL LIST USAGE REFERENCE	SHT 1 OF 4


MASTER MATERIAL LIST				
ITEM #	METRO STANDARD SA— WHICH USES THE ITEM			
31	341,349,351,361			
32	325			
33	325			
34	152,153			
35	163,165			
36	361			
37	333			
38	152			
39	152,308,348,358			
40	321,331,342,345,352			
41	321,322,325,331,332,349			
42	349			
43	*			
44	WFSC ONLY			
45	WFSC ONLY			
46	WFSC ONLY			
47	WFSC ONLY			
48	*			
49	349			
50	349			
51	349			
52	349			
53	307,317,342,352,373			
54	308,318,342,352,373			
55	234,341,342,345,348,349,351,352,355,358			
56	234,341,342,345,348,349,351,352,355,358			
57	341,342,345,348,349,351,352,358			
58	300,345			
59	402			
60	321,322,331,332,349,402			
61	231,232			
62	231			
63	232			
64	232			
65	232,351			
66	232			
67	401			
68	402			
69	402			
70	321,331,372			
71	402			
72	165			
73	WFSC ONLY			
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS MASTER MATERIAL LIST USAGE REFERENCE	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-098
APPROVED J DAVIS	CONTRACT NO:			SHT 2 OF 4


MASTER MATERIAL LIST				
ITEM #	METRO STANDARD SA— WHICH USES THE ITEM			
74	190			
75	190			
76	325			
77	401,411			
78	401			
79	341,349,351			
80	321,331,341,343,349,351,361,401			
81	401			
82	232			
83	401			
84	343,361			
85	401			
86	402			
87	361			
88	361			
89	361			
90	234,341,342,345,348,349,351,352,355,358			
91	401			
92	373			
93	401			
94	103,351,352,355,358			
95	103			
96	103,351,352,355,358			
97	104,351,352,355,358			
98	104			
99	103,104,351,352			
100	321,331			
101	152,321,331			
102	152,164,233,234,300,301,302,303,304,305,306,307,308,309,310,311,312, 313,314,315,316,317,318,320,321,322,325,331,332,341,342,343,345,348, 349,371,372,373,355,358			
103	152,164,233,234,300,301,302,303,304,305,306,307,308,309,310,311,312, 313,314,315,316,317,318,320,321,322,325,331,332,371,372,373			
104	231,232			
105	*			
106	343			
107	SEE PLANS FOR FREQUENCY OF USE (USED WITH SA-221)			
108	341,349,351,352,348,355,345,342,358			
109	341,349,351			
110	342,345,348,352,355,358			
111	351,352,355,358			
112	ATL BASE TRACK SPREADER			
113	ATL BASE TRACK SPREADER			
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS MASTER MATERIAL LIST USAGE REFERENCE	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-098
APPROVED J DAVIS	CONTRACT NO:			SHT 3 OF 4

[illegible]

SHT	4	OF	4
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





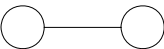
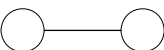
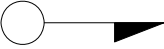

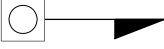
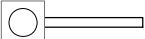
MASTER MATERIAL LIST				
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01		DETROIT CLAMP ASSY	WABCO	19293-3007
02		AGC TANGENT SPAN HANGER	WABCO	19360-2000
03		GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04		GUY GRIP DEADEND	PREFORMED	CDE-3106
05		WIRE ROPE CLIP, 5/16"	CROSBY	G450
06		FRICTION TAPE, 3/4" (6 WRAPS)		
07		THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08		GUY STRAND	COPPERWELD	8M
09		BULL RING	WABCO	18567-2000
10		HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
11		7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12		7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
13		GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14		GUY GRIP DEADEND	PREFORMED	CDE-3115
15		WIRE ROPE CLIP, 3/8"	CROSBY	G450
16		GUY STRAND	COPPERWELD	16M
17		THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
18		GUY STRAND, COVERED	COPPERWELD	8MI
19		GUY STRAND, COVERED	COPPERWELD	16MI
20		EYEBOLT	WABCO	11933-2000
21		7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6360
22		CLAMP STRAIN EYE	WABCO	10571-2000
23		7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6260
24		TROLLEY WIRE SUPPORT ASSY	WABCO	54962-3003
25		CURVE SEGMENT 8-12 DEG TYPE C	WABCO	22301-3014
		CURVE SEGMENT 13-27 DEG TYPE C	WABCO	22302-3005
		CURVE SEGMENT 28-47 DEG TYPE C	WABCO	22303-3005
26		TYPE PH-4 POS FEED SPAN HANGER	WABCO	54937-3002
27		TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54936-3002
28		INSULATOR SPOOL	WABCO	16835-2000
29		TYPE TCL CLEVIS TIP 4/0	WABCO	54950-3002
30		TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31		SPRING DETROIT CLAMP	WABCO	54959-3001
32		TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54936-3001
33		TYPE PH-4 POS FEED SPAN HANGER	WABCO	54937-3001
34		TYPE T DOUBLE EAR STRAIN CLAMP	WABCO	17700-2000
35		CLAMP-INSUL LEAD WIRE	WABCO	19655-2000
36		7/8 TRANSLITE STRAIN INSUL W/ ADJUST END FITTINGS	WABCO	54980-6385
37		NO-BO SECTION INSUL	WABCO	55025-3001
38		7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6200
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS MASTER MATERIAL LIST	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-099
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 4

MASTER MATERIAL LIST				
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
39		5/8" SHACKLE	WABCO	13722-2000
40		7/8 TRANSLITE STRAIN INSUL CL-90	WABCO	54995-6120
41		H.S.P. FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
42		FEEDER CLAMP, BRONZE	WABCO	19790-4004
43				
44		RUNNER, 6 FT TYPE C, 8 TO 12 DEG	WABCO	21375-2000
45		PLATE-STRAIN 5 TO 12 DEG	WABCO	20290-2000
46		SINGLE CURVE HANGER, TYPE A-2	WABCO	14072-2000
47		DOUBLE CURVE HANGER, TYPE A-2	WABCO	14073-2000
48				
49		COMPRESSION CONNECTOR COPPER, LONG BARREL, TIN PLATED, FLARED	ANDERSON/ SQUARE D	VHCL- 2/0-12BNF
50		COMPRESSION CONNECTOR COPPER, LONG BARREL, TIN PLATED, FLARED	ANDERSON/ SQUARE D	VHCL- 500-12BNF
51		MULTI-LOK TIES (18") NYLON COATED	BAND-IT	AE714
52		TUF NEOPRENE AIR HOSE SLEEVE 1.5" ID x 2.0625" OD (BLACK)	McMASTER- CARR	3 BRAID
53		CURVE RAIL (1° TO 5°, 2' LG)	K & M	851 B412/0
54		CURVE RAIL (5.5° TO 7.5°, 4' LG)	K & M	851 B412/1
55		PHILLYSTRAN (3/8")	PHILLYSTRAN INC	HPTG 6700I
56		PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC	PLP 2755
57		FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" DIA x 1/4"	STRONGWELL	EXTREN SERIES 525
58		TANGENT SPAN HANGER	K & M	C-1728-01
59		CONDUIT CLAMP WITH 2" MTG SCREW		
60		FEED SPAN CABLE, 500 KNM CU UNSHIELDED, 5KV EPR WITH PVC JACKET		
61		GUY GUARD, 8 FT FOR USE ON 3/16" TO 1/2" STRAND	PREFORMED	PG 5518
62		POWER INSTALLED SCREW ANCHOR	CHANCE	E102-1219
63		POWER INSTALLED SCREW ANCHOR	CHANCE	C102-1260
64		POLE PLATE, 2 1/2" PIPE	JOSLYN	J0521
65		LAG SCREW, FETTER DRIVE, 1/2" x 4"	JOSLYN	J8754
66		END FITTING, 2 1/2" PIPE	COOPER POWER SYSTEM	DG5G1
67		CLOVERLEAF EPOXIROD STANDOFF	CHANCE	C653-1038
68		UNIVERSAL SERVICE CONNECTOR	BURNDY	KVSU34
69		SEALING BUSHING, TYPE KR WITH TYPE M CABLE SUPPORT, 2 1/2" CONDUIT	O-Z-GEDNEY	KR250 & RPLG-2001-1
70		EYEBOLT, 5/8" x 6" WITH 2 NUTS & LOCKWASHER		
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS MASTER MATERIAL LIST	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-099
APPROVED J DAVIS	CONTRACT NO:			SHT 2 OF 4

MASTER MATERIAL LIST				
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
71		WATERTIGHT STR STRAIN RELIEF CONN, 1 1/2" CONDUIT	O-Z-GEDNEY	SR 15012 H.D. GALV
72		INDUCTIVE CONTROL SYSTEM RECEIVER INDUCTIVE CONTROL SYSTEM ANTENNA	UNITRAC UNITRAC	320100-16X 320310-4X
73		ANCHOR SHACKLE	JOSLYN	J2742
74		4' x 8' x 1/2" EXTERIOR PLYWOOD		
75		U-BOLT TO FIT 4/0 TROLLEY WIRE		
76		4/0 STRANDED INSUL CABLE		
77		ELECT WARNING TAPE, 6" YELLOW	BRADY	UT 20-Y6
78		CONNECTOR, PARALLEL CLAMP	BURNDY	QPX342C
79		5/8"-11 UNC x 3/8" STUD		
80		3/4" x 0.03" SS BANDING TYPE 201	BAND-IT	C206
81		CONNECTOR, SERVICE, SPLIT BOLT	BURNDY	KS20
82		2 1/2" DIA ASTM A53 GRB STD WT GALV STEEL PIPE		
83		MOLDING, PLASTIC, GROUND WIRE, 1/2" X 1/16" X 8'	JOSLYN	PM128
84		SCHED 40 PVC, GREY, SPLIT		
85		1000 VOLT DC ARRESTER, 907 MCOV	IMPULSE	P/N 1057
86		GALV RIGID STEEL CONDUIT		
87		5/8"-11 UNC x 6" THREADED ROD, GALV ASTM A36	5/8"-11 UNC x 6" THREADED R GALV ASTM A36	
88		5/8"-11 UNC HVY HEX JAM NUT GALV ASTM A563 GRA		
89		11/16" LOCKWASHER		
90		HEAVY PIPE CLAMP, GALV	GRINNELL	FIG 216
91		STAPLES, ROLLED POINT, GALV, 2" x 1/2" x 0.162"	JOSLYN	J156
92		ANGLE CLAMP, DUCTILE IRON	ANDERSON/ SQUARE D	82860-2000
93		STAPLES, ROLLED POINT, GALV, 1 3/4" x 1/4" x 0.148"	JOSLYN	J1673
94		5/8" OVAL EYEBOLT WITH NUT	JOSLYN	J94XX
95		3/4" OVAL EYEBOLT WITH NUT	JOSLYN	J95XX
96		SQ CURVED WASHER 3" x 3" x 1/4", 11/16" DIA	JOSLYN	J113
97		3/4" MACHINE BOLT	JOSLYN	J89XX
98		GUY HOOK, 3/4"	STANLEY FLAGG	P133AX
99		SQ CURVED WASHER 3" x 3" x 1/4", 13/16" DIA	JOSLYN	J6823
100		EPPOXIROD DEADEND ARM	CHANCE	COEH36DP
101		STRAIN PLATE	METRO STD	SA-101
DESIGNED A WOLAK		CHKD: D GREER	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS MASTER MATERIAL LIST	DATE: APRIL 2008
DR: B FARISSB		SCALE: NONE		FILE
RECOM.		IBIS NO:		DWG. NO. SA-099
APPROVED J DAVIS		CONTRACT NO:		SHT 3 OF 4
 King County				

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
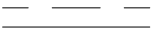



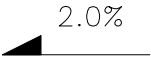




SHT	4	OF	4
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STANDARD #	SYMBOLS	DESCRIPTION
		EXISTING WOOD POLE
SA-202 & SA-214		INSTALL WOOD POLE
		REMOVE WOOD POLE
		EXISTING DIRECT EMBEDMENT STEEL POLE
SA-201,SA-212 & SA-215		INSTALL DIRECT EMBEDMENT STEEL POLE
		REMOVE DIRECT EMBEDMENT STEEL POLE
		EXISTING ANCHOR BASE STEEL POLE
SA-201,SA-213 & SA-216		INSTALL ANCHOR BASE STEEL POLE
		REMOVE ANCHOR BASE STEEL POLE
		EXISTING BUILDING EYEBOLT
SA-107 & SA-221		INSTALL NEW BUILDING EYEBOLT
		EXISTING DOWN GUY ON POLE
SA-231		INSTALL DOWN GUY ON POLE
		EXISTING SIDEWALK GUY ON POLE
SA-232		INSTALL SIDEWALK GUY ON POLE
		EXISTING HEAD GUY, POLE TO POLE
SA-233		INSTALL HEAD GUY, POLE TO POLE
		EXISTING POLE BRACKET
SA-351 & SA-352		INSTALL WOOD POLE BRACKET
SA-341 & SA-342		INSTALL STEEL POLE BRACKET
		TRAFFIC SIGNAL MAST ARM

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS SYMBOLS AND ABBREVIATIONS	DATE: APRIL 2008
DR: B FARISB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-100
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 3

SYMBOLS

DESCRIPTION

	PORCELAIN STRAIN INSULATOR
	ADJUSTMENT POINT (AT INSULATOR)
	TROLLEY WIRE, (DOUBLE LINE)  NEGATIVE  POSITIVE
	TROLLEY WIRES, NEGATIVE AND POSITIVE (SINGLE LINE)
	STREET GRADE (DOWNHILL SLOPE)
	TROLLEY STANDARD DRAWING NUMBER
	BULLRING
	INDUCTIVE CONTROL ENCLOSURE ON POLE
	INDUCTIVE CONTROL ENCLOSURE ON WALL

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS SYMBOLS AND ABBREVIATIONS	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-100
APPROVED J DAVIS	CONTRACT NO:			SHT 2 OF 3

ABBREVIATIONS

BEB	BUILDING EYEBOLT
CS	CURVE SEGMENT
DCH	DOUBLE CURVE HANGER
LHI	LEFT HAND INDUCTIVE SWITCH
RHI	RIGHT HAND INDUCTIVE SWITCH
LHD	LEFT HAND DIRECTIONAL SWITCH
RHD	RIGHT HAND DIRECTIONAL SWITCH
LHT	LEFT HAND TRAILING SWITCH
RHT	RIGHT HAND TRAILING SWITCH
R XO	RIGID CROSSOVER
XOCS	RIGID CROSSOVER AND CURVE SEGMENT ASSEMBLY



IS INSULATION IN THE STRAIGHT



IC INSULATION IN THE CURVE




RS RESET TO STRAIGHT

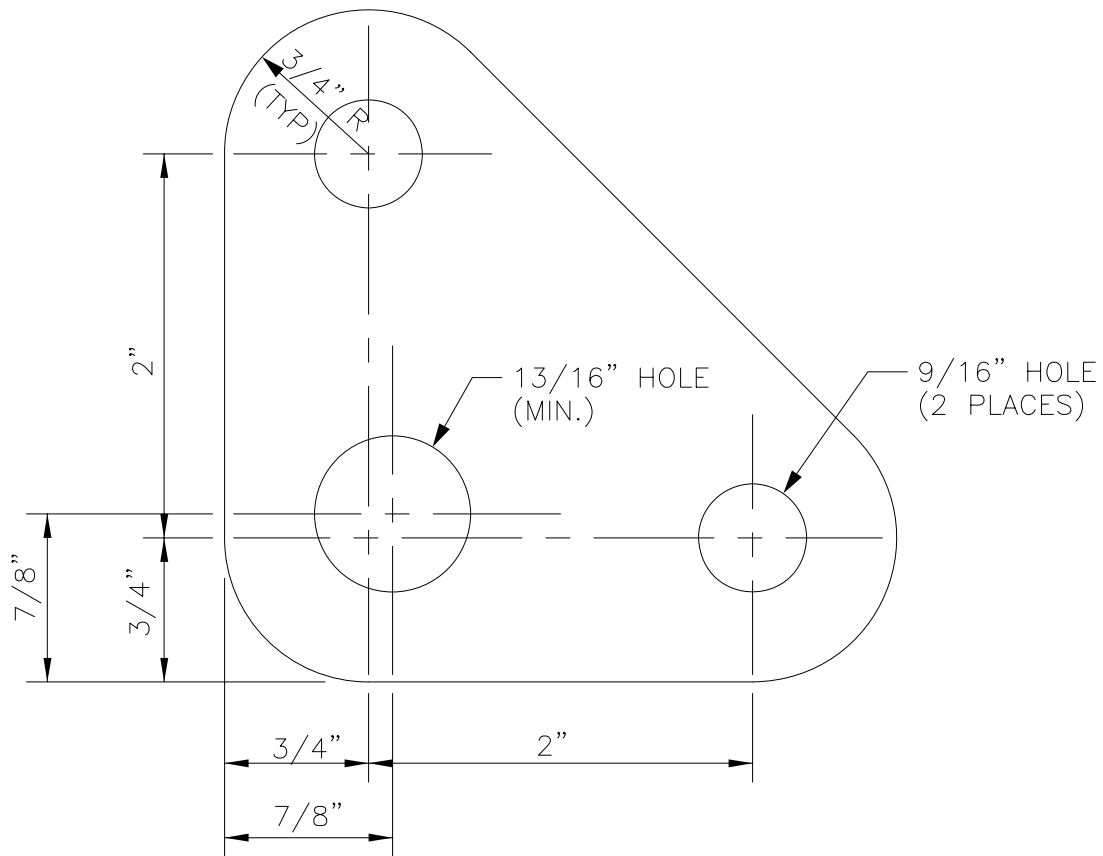
C	SEATTLE CITY LIGHT
L	LUMINAIRE, SED
M	METRO
S	TRAFFIC SIGNAL, SED
T	TELEPHONE
V	CABLE TV

PRESENTED IN
VARIOUS JOINT USE
POLE COMBINATIONS

8M,
16M COPPERWELD GUY WIRE

8MI,
16MI COPPERWELD GUY WIRE, COVERED

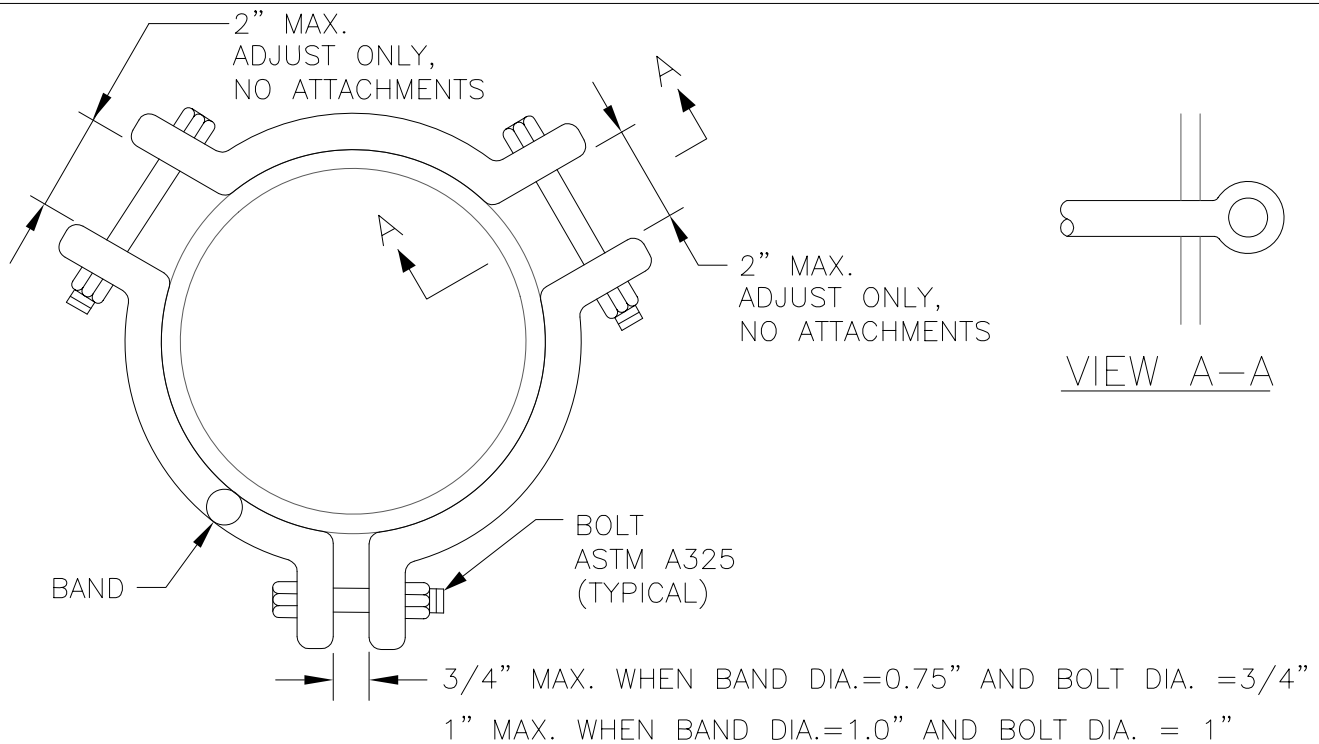
	REVISED AS CONSTRUCTED			CMS	DPG	06/05
No.	REVISION			BY	APP'D	DATE
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS SYMBOLS AND ABBREVIATIONS			DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE					FILE
RECOM.	IBIS NO:					DWG. NO. SA-100
APPROVED J DAVIS	CONTRACT NO:					SHT 3 OF 3



MATERIAL: ASTM A36 1/2" STEEL PLATE
HOT DIP GALVANIZE AFTER
FABRICATION.

NOTE: USED ON DOUBLE FEEDER SPANS
AND DEADENDS.

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS STRAIN PLATE	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-101
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



PLAN VIEW

COLLAR MAX LOAD=2500 LB			
DIAMETER RANGE	POLE SIZE		BAND & BOLT DIA.
	BUTT ϕ	ATT HT	
4.25" – 5.5"	8"	19' – 24'	.75"
6" – 7.25"	10"	19' – 29'	.75"
7" – 8.25"	11"	19' – 29'	.75"
8" – 9.25"	12"	19' – 29'	.75"
9" – 10.25"	13"	19' – 29'	.75"
10" – 11.25"	14"	19' – 29'	.75"
11" – 12.25"	15"	19' – 29'	.75"

COLLAR MAX LOAD=5000 LB			
DIAMETER RANGE	POLE SIZE		BAND & BOLT DIA.
	BUTT ϕ	ATT HT	
9" – 10.25"	13"	19' – 29'	1"
10" – 11.25"	14"	19' – 29'	1"
11" – 12.25"	15"	19' – 29'	1"

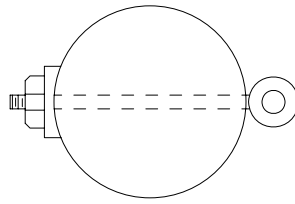
NOTES

- CONTACT KORTICK MFG CO AT: 5600 3RD ST, SAN FRANCISCO, CA
(415) 822-6660
- MAXIMUM NUMBER OF ATTACHMENTS PER COLLAR IS ONE, UNLESS APPROVED
BY THE ENGINEER.

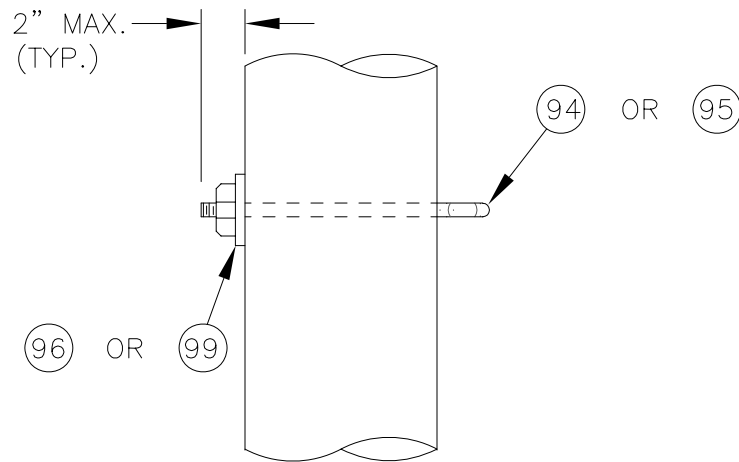
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS STEEL POLE COLLAR	DATE: APRIL 2008
DR: B FARISB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-102
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



PLAN



WOOD POLE EYEBOLT

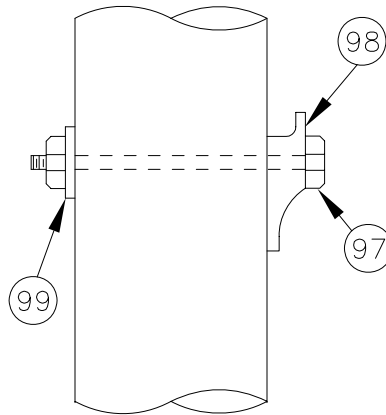
NOTES:

1. WOOD POLE EYEBOLTS SHALL HAVE A MINIMUM DIAMETER OF 5/8". 5/8" DIAMETER EYEBOLTS SHALL BE USED FOR WOOD POLE ATTACHMENT OF ALL SINGLE 8M TANGENT WORK SPANS. 3/4" DIAMETER EYEBOLTS SHALL BE USED FOR ALL OTHER WOOD POLE ATTACHMENTS.
2. MULTIPLE CABLE ATTACHMENTS TO 3/4" DIAMETER EYEBOLTS SHALL BE LIMITED TO A RESOLVED (RESULTANT) DESIGN TENSION OF 5000 LBS @ 60 DEGREES F.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
94	*	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
95	*	3/4" OVAL EYEBOLT W/ NUT	JOSLYN	J95XX
96	*	SQ CURVED WASHER 3"x3"x1/4", 1 1/16" DIA	JOSLYN	J113
99	*	SQ CURVED WASHER 3"x3"x1/4", 1 3/16" DIA	JOSLYN	J6823

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS WOOD POLE EYEBOLT ASSEMBLY	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-103
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1

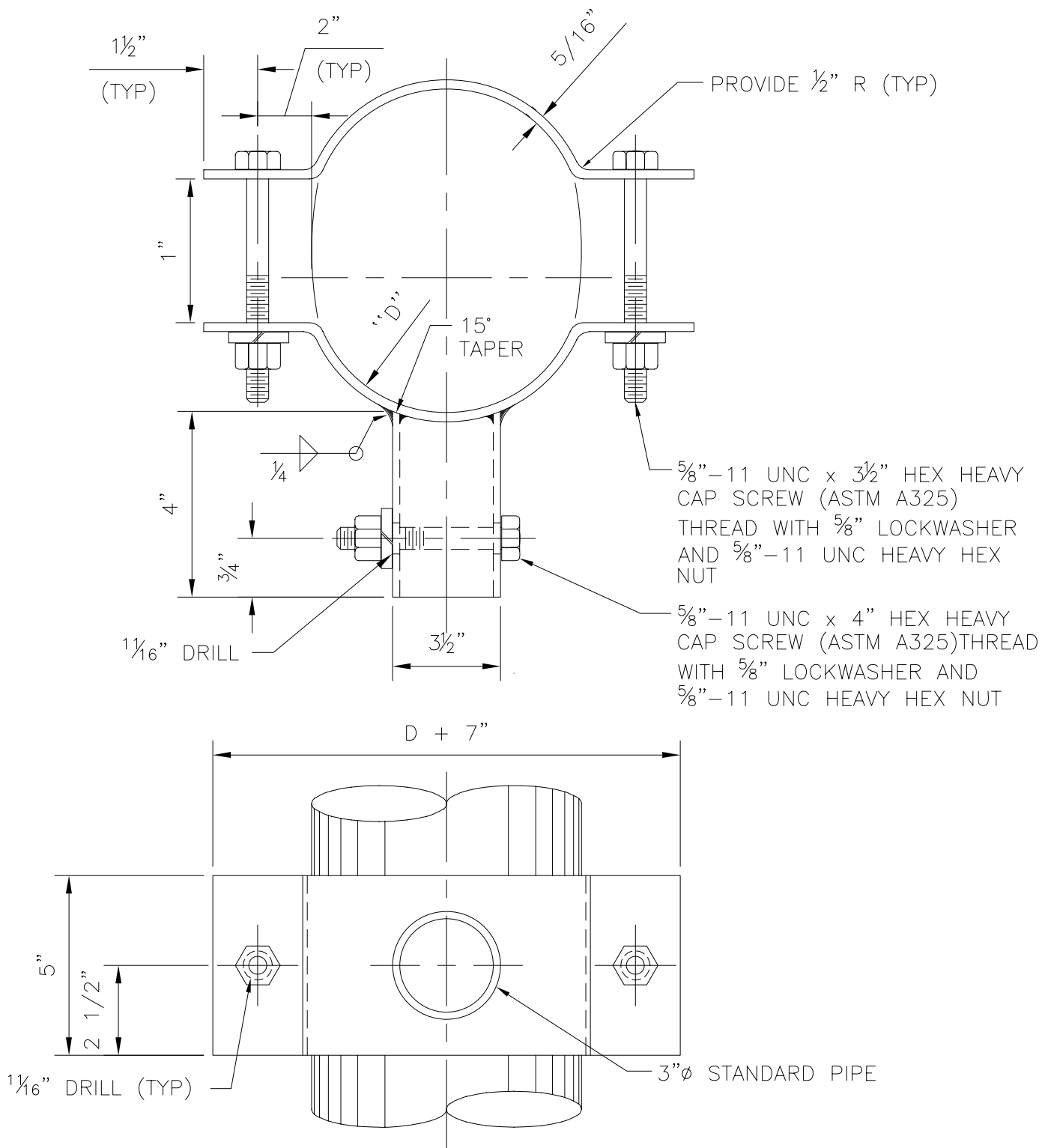


WOOD POLE
DOWN GUY ATTACHMENT

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
97	1	$\frac{3}{4}$ " MACHINE BOLT	JOSLYN	J89XX
98	1	GUY HOOK, $\frac{3}{4}$ "	STANLEY	P133AX
99	1	SQ CURVED WASHER 3"x3"x $\frac{1}{4}$ ", $\frac{13}{16}$ " DIA	JOSLYN	J6823

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS WOOD POLE DOWN GUY ASSEMBLY	DATE: APRIL 2008
DR: B FARISSE	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-104
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



NOTES

1. DIMENSION "D" TO BE FIELD MEASURED AT DESIGN ATTACHMENT HEIGHT.
2. MATERIAL FOR COLLARS SHALL BE ASTM A-36 STEEL. HOT DIP GALVANIZE METAL AFTER FABRICATION.

DESIGNED
A WOLAK

CHKD:
D GREER

DR:
B FARISSB

SCALE:
NONE

RECOM.

IBIS NO:

APPROVED
J DAVIS

CONTRACT NO:



METRO TRANSIT DIVISION
TROLLEY OVERHEAD SYSTEM
STANDARDS

COMPRESSION
POLE BRACKET
POLE COLLAR

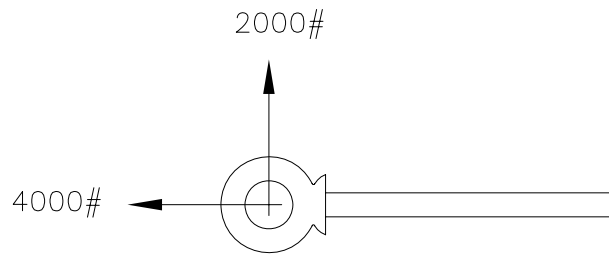
DATE:
APRIL 2008

FILE

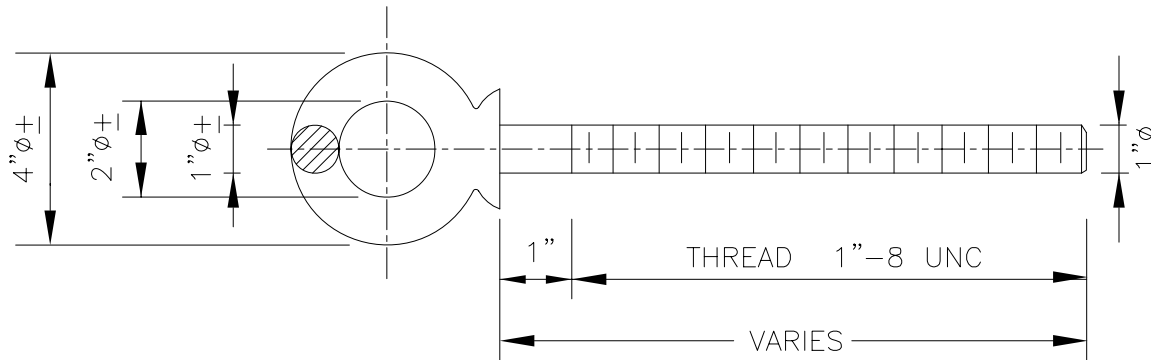
DWG. NO.

SA-106

SHT 1 OF 1



ALLOWABLE DEAD LOAD AT 60°.



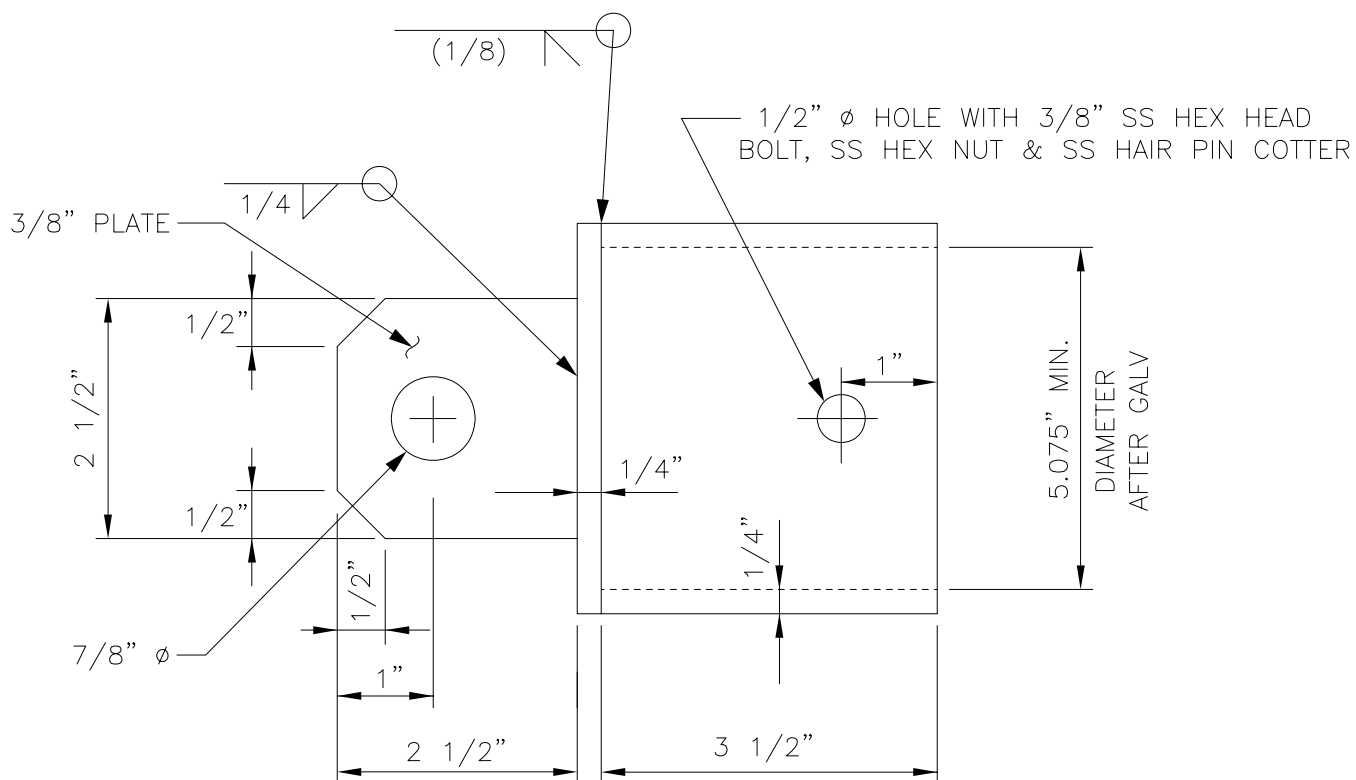
NOTES:

1. EYEBOLT SHALL BE 1" DROP FORGED, STAINLESS STEEL, SHOULDER PATTERN; MADE FROM TYPE 316 STAINLESS STEEL, UNC-2 THREADS, ELECTRO-POLISHED FINISH.
2. EYEBOLT SHALL BE MCGRAW-EDISON, CAMPBELL CHAIN M-29-ST 640-5015, MCMASTER-CARR 3032T49. NUMBERS ARE FOR 6" LENGTH; OTHER LENGTHS ARE SPECIAL.
3. MATERIAL YIELD STRESS SHALL BE 30,000 PSI MIN. TENSILE STRESS SHALL BE 75,000 PSI MIN.

DESIGN NOTES:

1. THE DEAD LOAD + LIVE LOAD IS 2 TIMES THE ALLOWABLE DEAD LOAD AT 60°. THE BREAKING LOAD IS 4 TIMES THE ALLOWABLE DEAD LOAD AT 60°.

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS STAINLESS STEEL EYEBOLT	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-107
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



POLE END CAP DETAIL

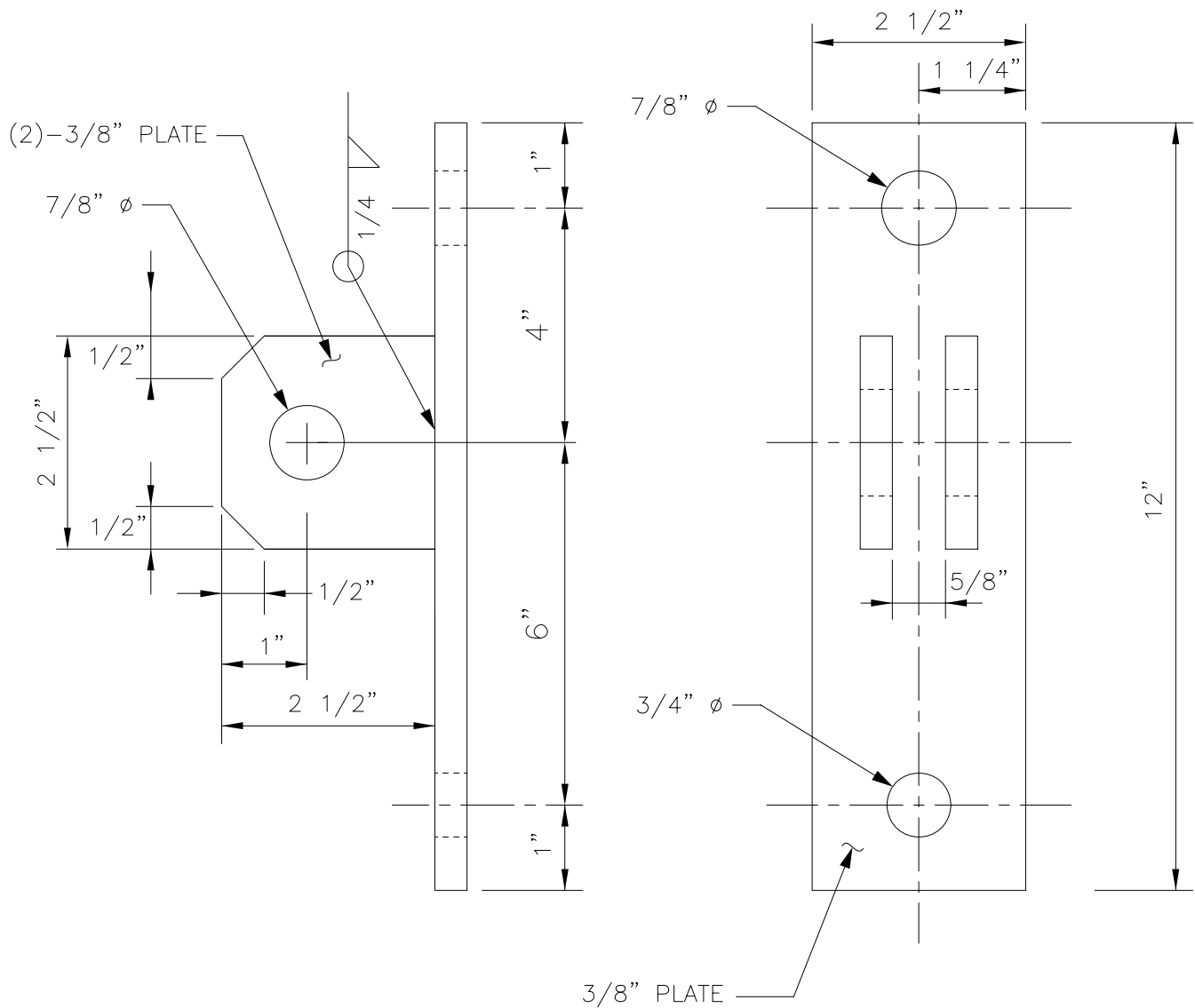
NOTES:

1. GALVANIZE AFTER FABRICATION.

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS BRACKET ARM POLE END CAP	DATE: APRIL 2008
DR: B FARISB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-108
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:		BRACKET ARM END CAP	DWG. NO. SA-109
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1

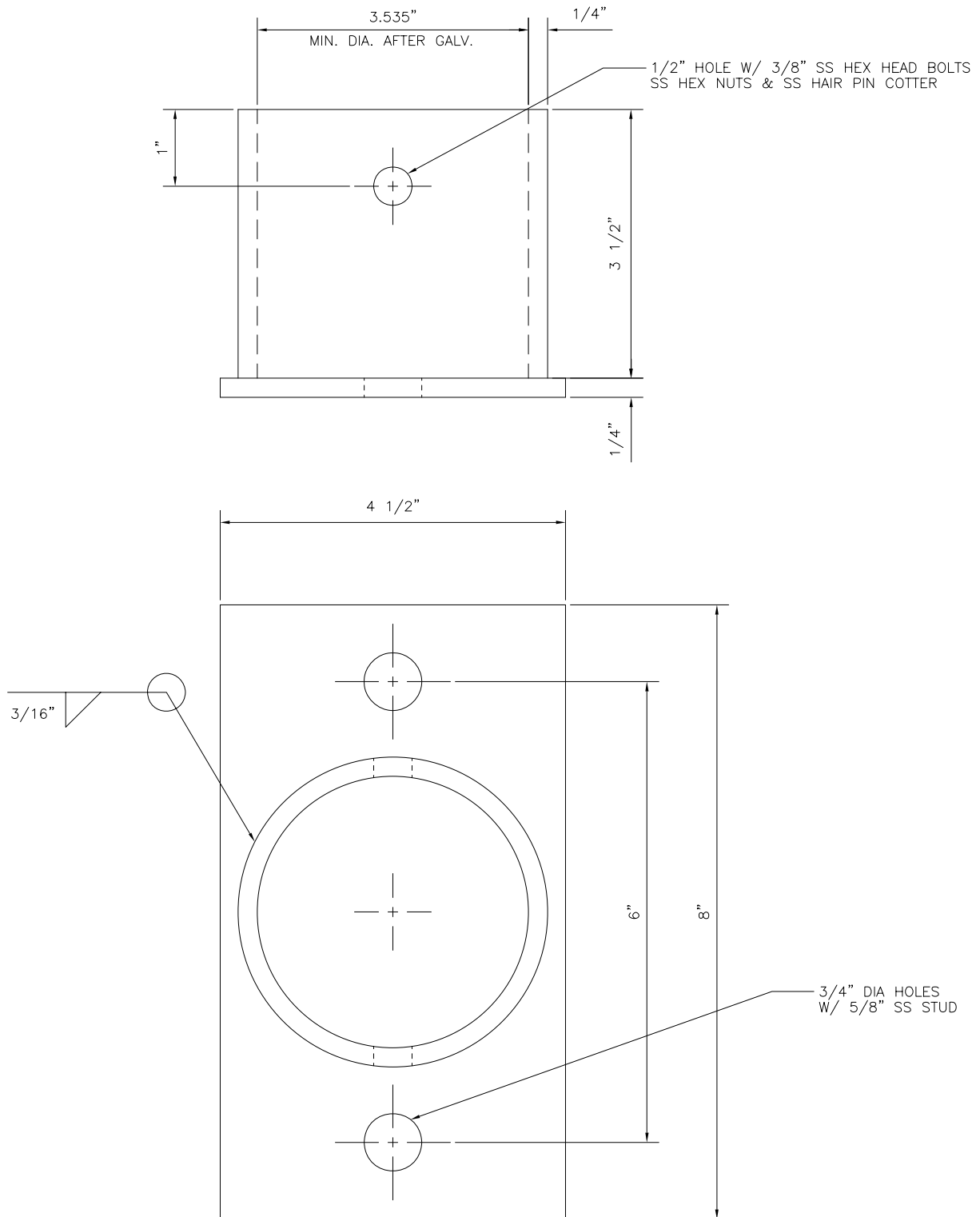


WOOD POLE
MOUNTING BRACKET DETAIL

NOTES:

1. GALVANIZE AFTER FABRICATION.

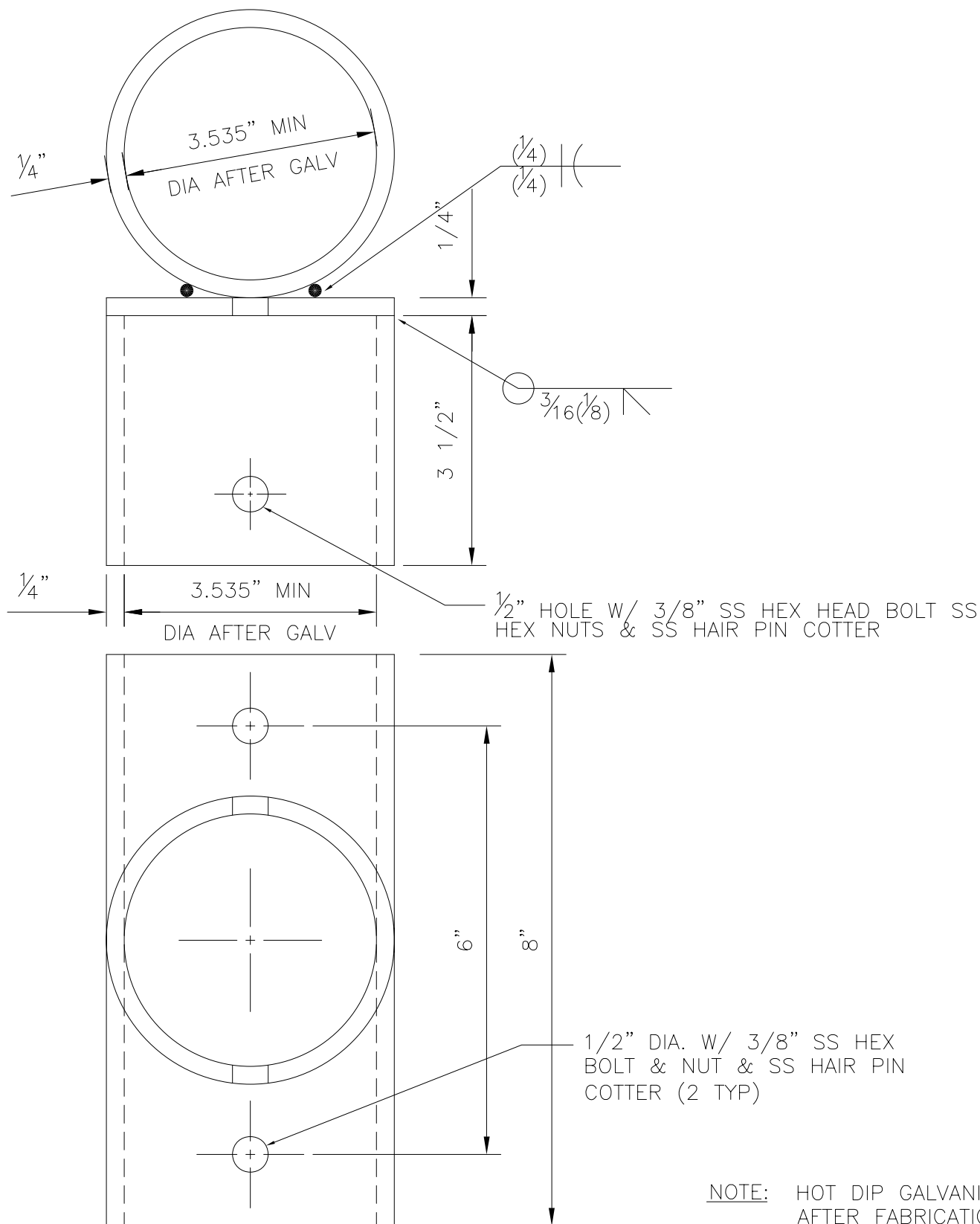
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS WOOD POLE MOUNTING BRACKET	DATE: APRIL 2008
DR: B FARISSE	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-111
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



NOTE: HOT DIP GALVANIZE AFTER FABRICATION

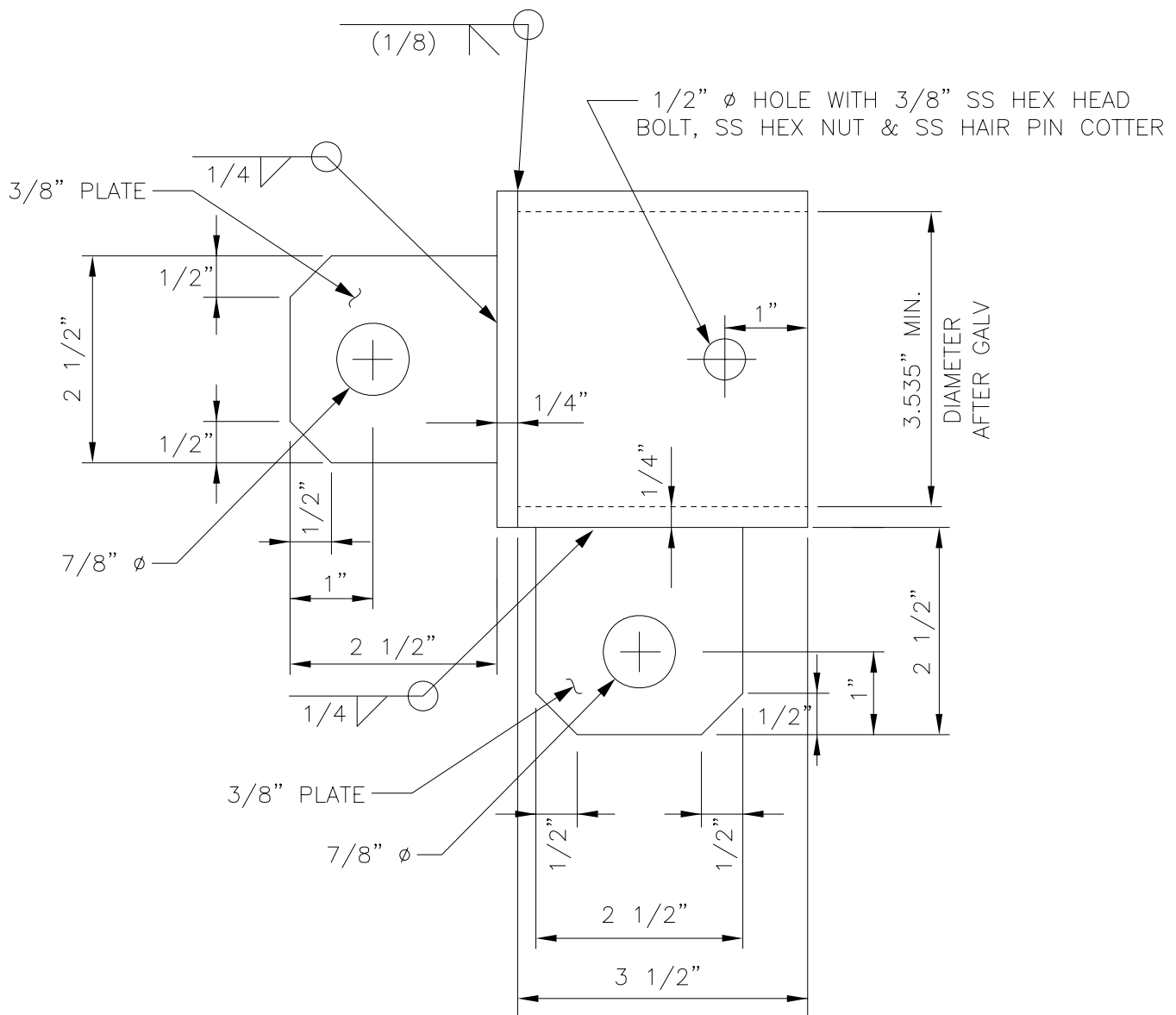
3.5" TUBE SOCKET PLATE

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS 3.5" TUBE SOCKET PLATE	DATE: APRIL 2008
DR: B FARISSB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-112
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1



3.5" TUBE TEE SLIPFIT & SOCKET

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS 3.5" TUBE TEE SLIPFIT & SOCKET	DATE: APRIL 2008
DR: B FARISB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-113
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1

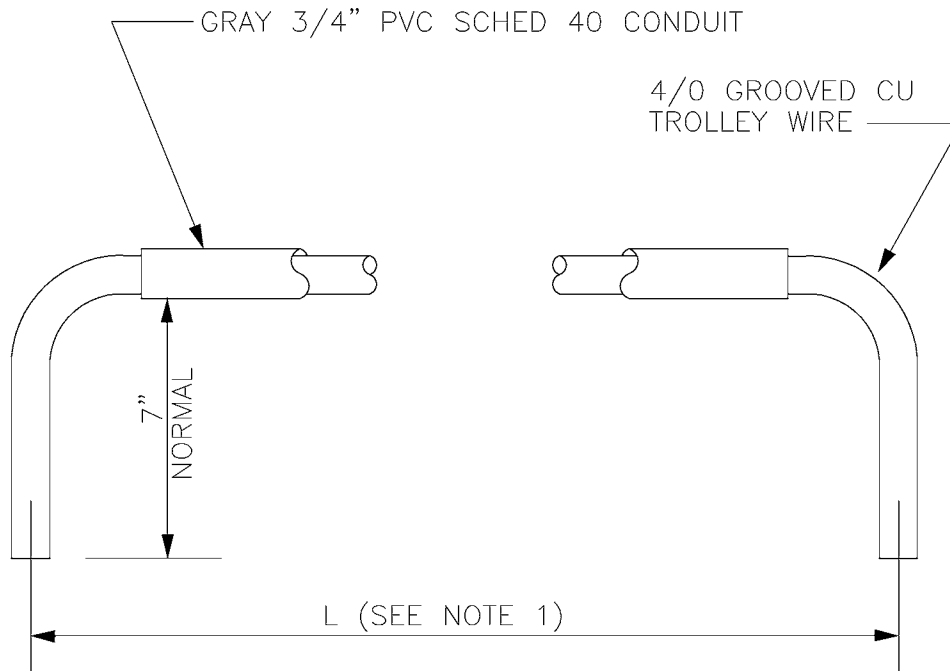


POLE END CAP WITH BOTTOM TAB DETAIL

NOTES:

1. GALVANIZE AFTER FABRICATION.

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS BRACKET ARM POLE END CAP WITH BOTTOM TAB	DATE: APRIL 2008
DR: B FARISB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-114
APPROVED J DAVIS	CONTRACT NO:			SHT 1 OF 1

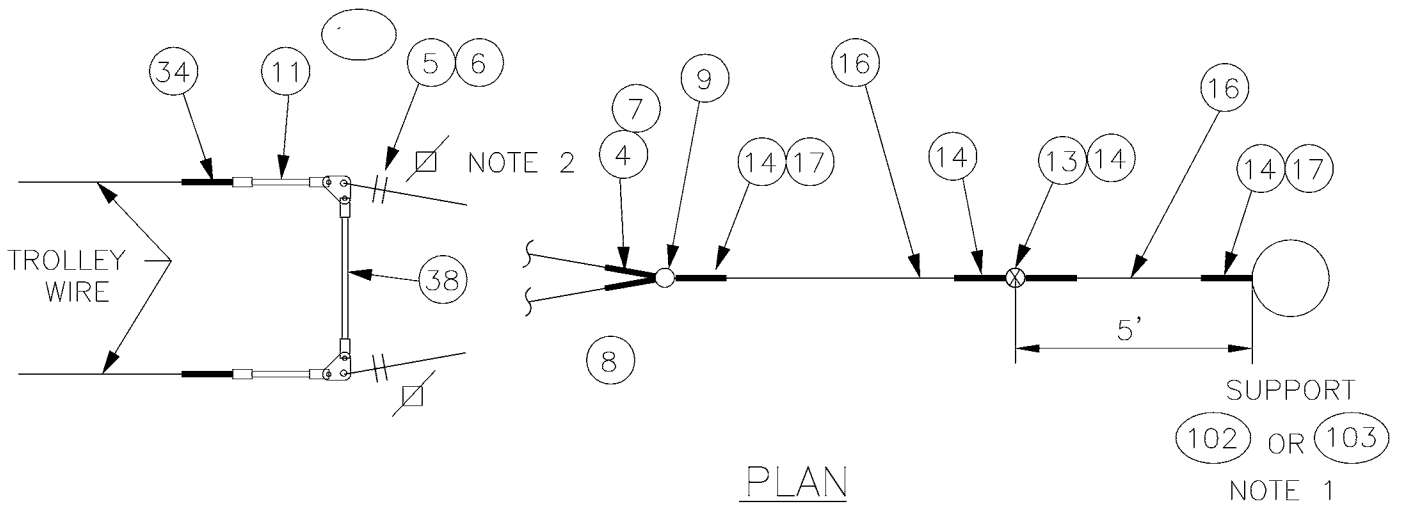


NOTES:

1. JUMPER WIRE AND ASSOCIATED INSULATING SLEEVE SHALL BE FIELD CUT TO LENGTH AS REQUIRED FOR EACH SPECIAL WORK DEVICE.

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SPECIAL WORK INSULATED JUMPER ASSEMBLY	DATE: JUN 95
DR: CMS	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-151
APPROVED				SHT 1 OF 1



NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS SHOWN ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "☒". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
	6	GUY GRIP DEADEND	PREFORMED	CDE-3106
	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
	VARIES	GUY STRAND	COPPERWELD	8M
	1	BULL RING	WABCO	18567-2000
	2	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
	1		PORCELAIN PRODUCTS CO.	506
	4	GUY GRIP DEADEND	PREFORMED	CDE-3115
	VARIES	GUY STRAND	COPPERWELD	16M
	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
	2		WABCO	17700-2000
	1	SLITE STRAIN INSUL CL-CL	WABCO	54975-6200
	2		WABCO	13722-2000
	2		METRO STD	SA-101
	VARIES		KORTICK MFG CO	
	VARIES		METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

TROLLEY WIRE
DEADEND ASSEMBLY

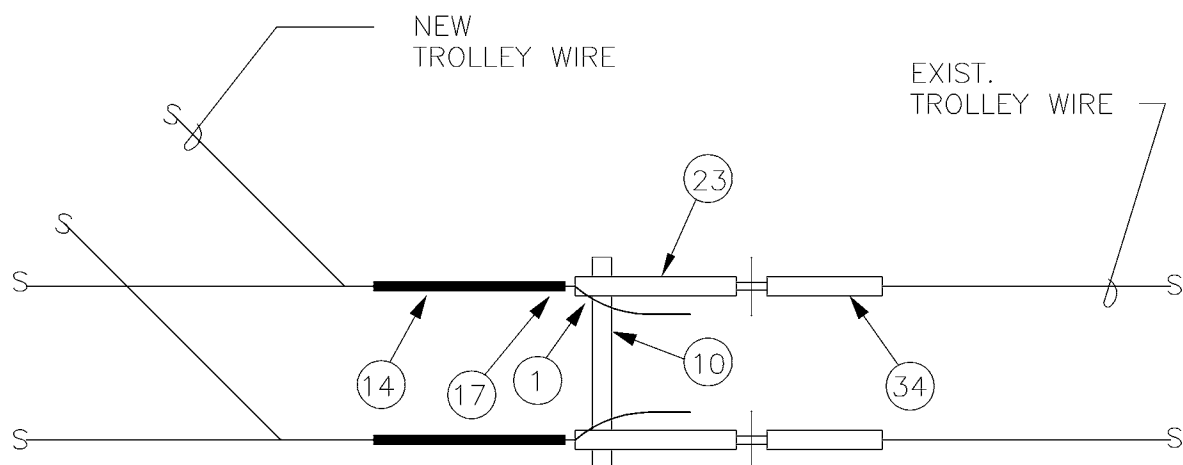
DATE:
OCT 95

FILE

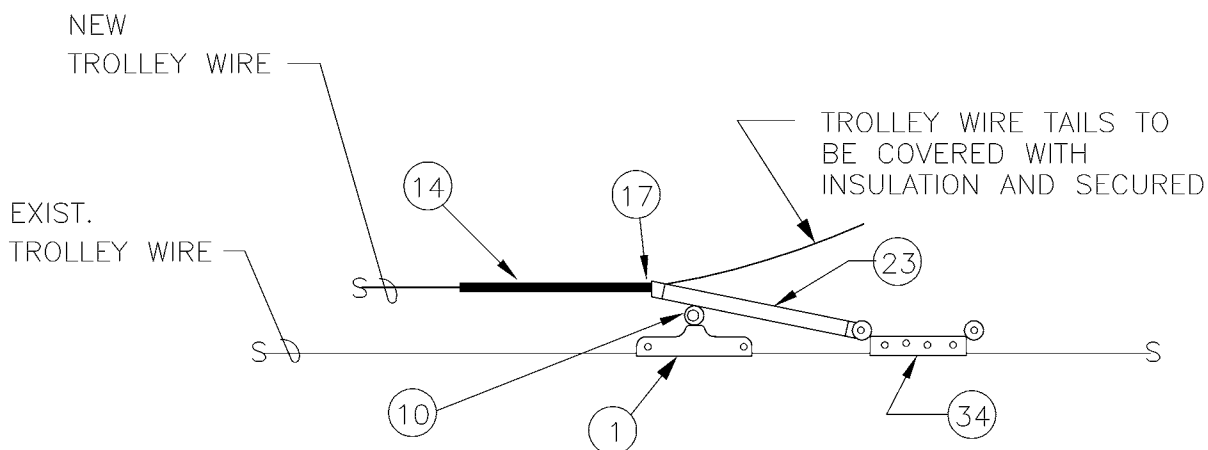
DWG. NO.

SA-152

SHT 1 OF 2



PLAN



ELEVATION

SCALE: NONE

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
14	2	GUY GRIP DEADEND	PREFORMED	CDE-3115
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
23	2	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6260
34	2	TYPE T DOUBLE EAR STRAIN CLAMP	WABCO	17700-2000

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STAGING
DEADEND ASSEMBLY

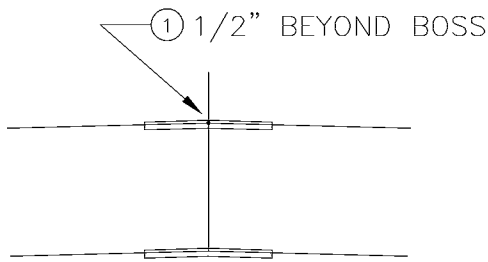
DATE:
JUN 95

FILE

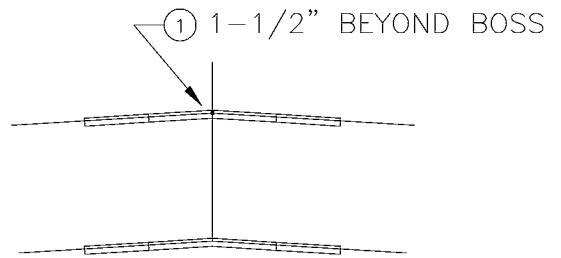
DWG. NO.

SA-153

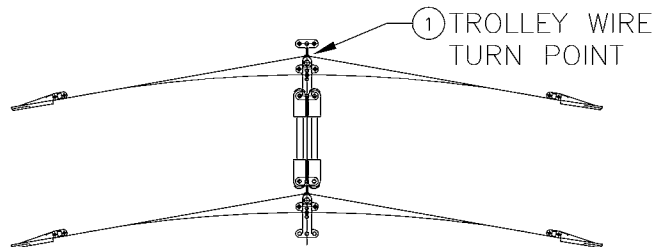
SHT 1 OF 1



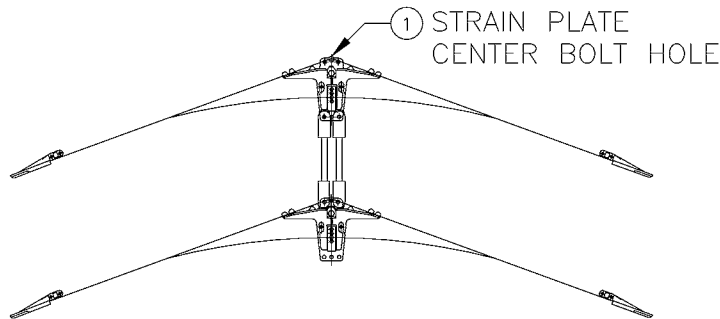
1°-5° CURVE RAIL



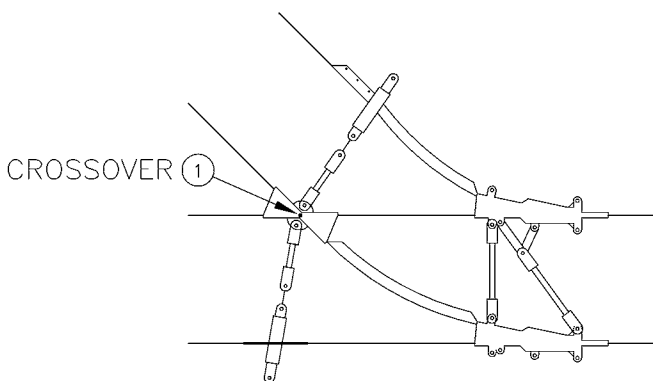
5.5°-7.5° CURVE RAIL



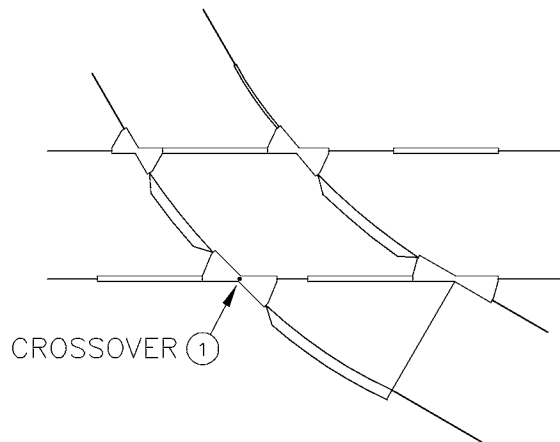
8°-12° & 13°-27° CURVE SEGMENT



28°-47° CURVE SEGMENT




SWITCH OR TRAILING FROG

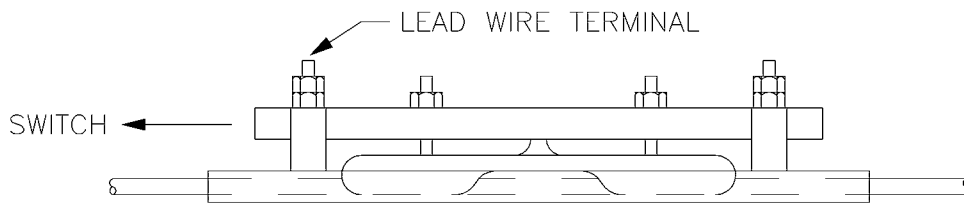


CROSSOVER/CURVE SEGMENT

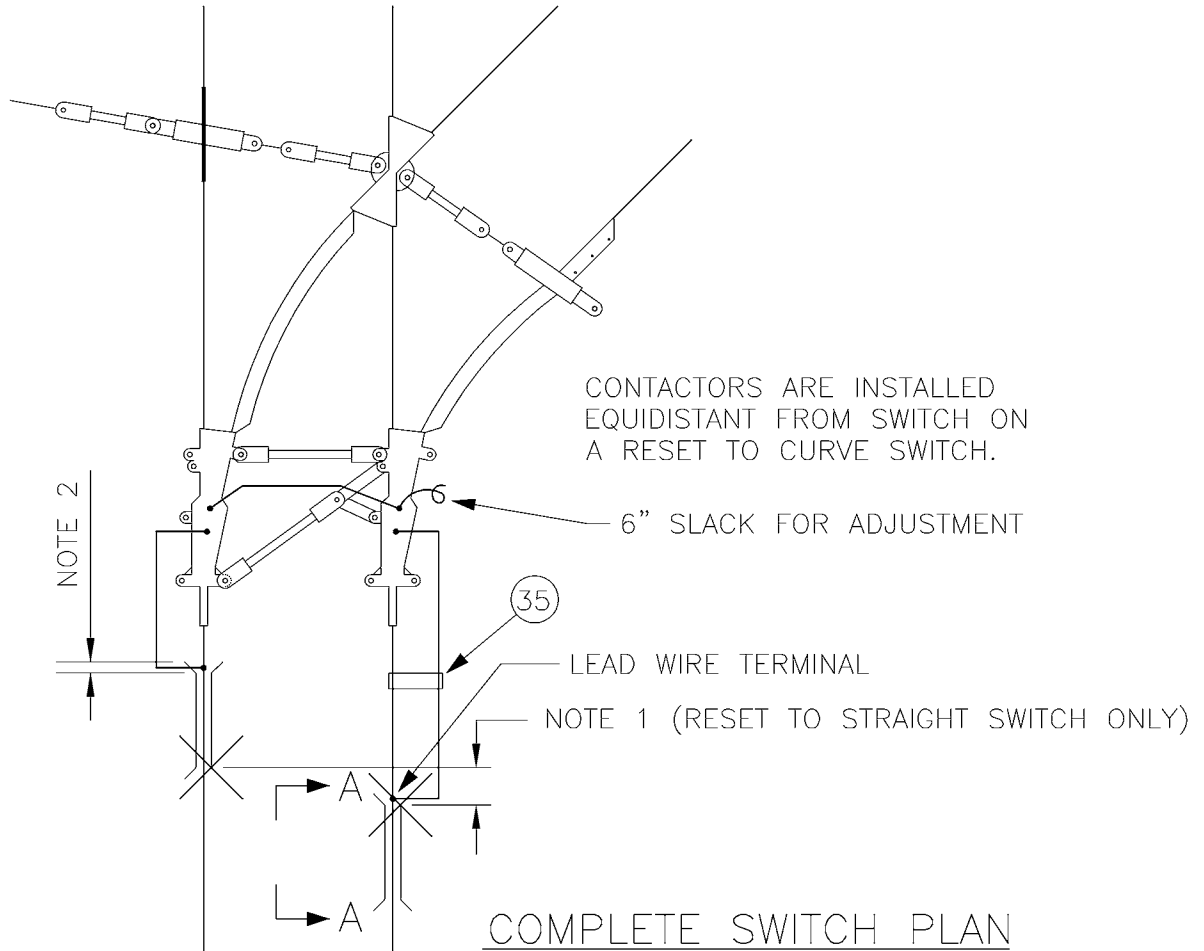
① DEVICE REFERENCE POINT

V:\Library & Standards\Standards\Trolley\Details\SA-161.1\1572007 12:18:54 PM

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SPECIALWORK DEVICE REFERENCE POINT LOCATIONS	DATE: JUN 95
DR: CMS	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-161
APPROVED				SHT 1 OF 1



CONTACTOR ELEVATION A-A



COMPLETE SWITCH PLAN

NOTES

1. PROVIDE A 4-1/2" INTERVAL BETWEEN OPPOSITE POLARITY CONTACTORS. MEASURE FROM POINT OF CONTACT WITH TROLLEY SHOE AND CONTACTOR.
2. PROVIDE A 1" OVERLAP BETWEEN CONTACTOR AND END OF SWITCH TROLLEY WIRE CLAMP.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
35	AS REQD	CLAMP, INSUL LEAD WIRE	WABCO	19655-2000

DESIGNED DPG	CHKD: DOW
DR: TMB	SCALE: NONE
RECOM.	CONTRACT:
APPROVED	

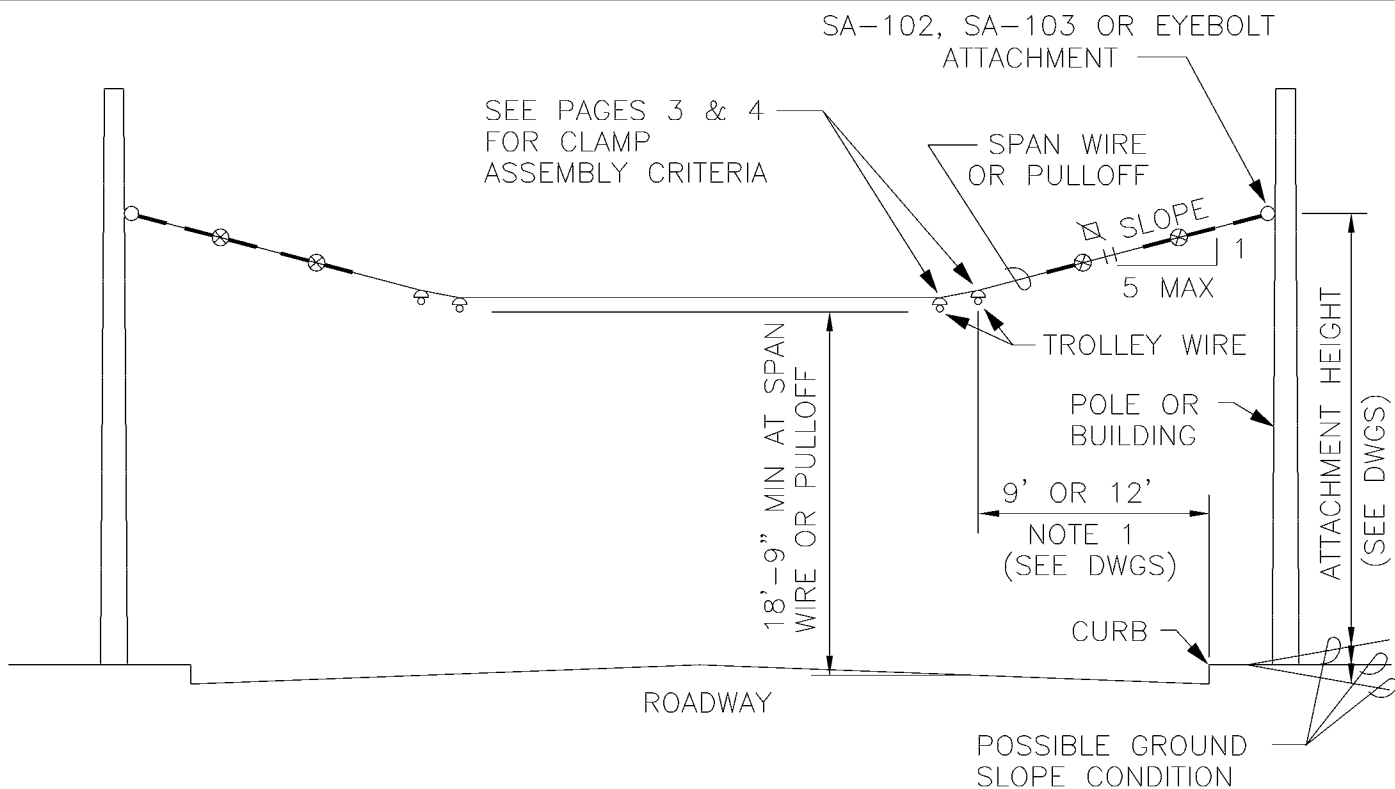


King County

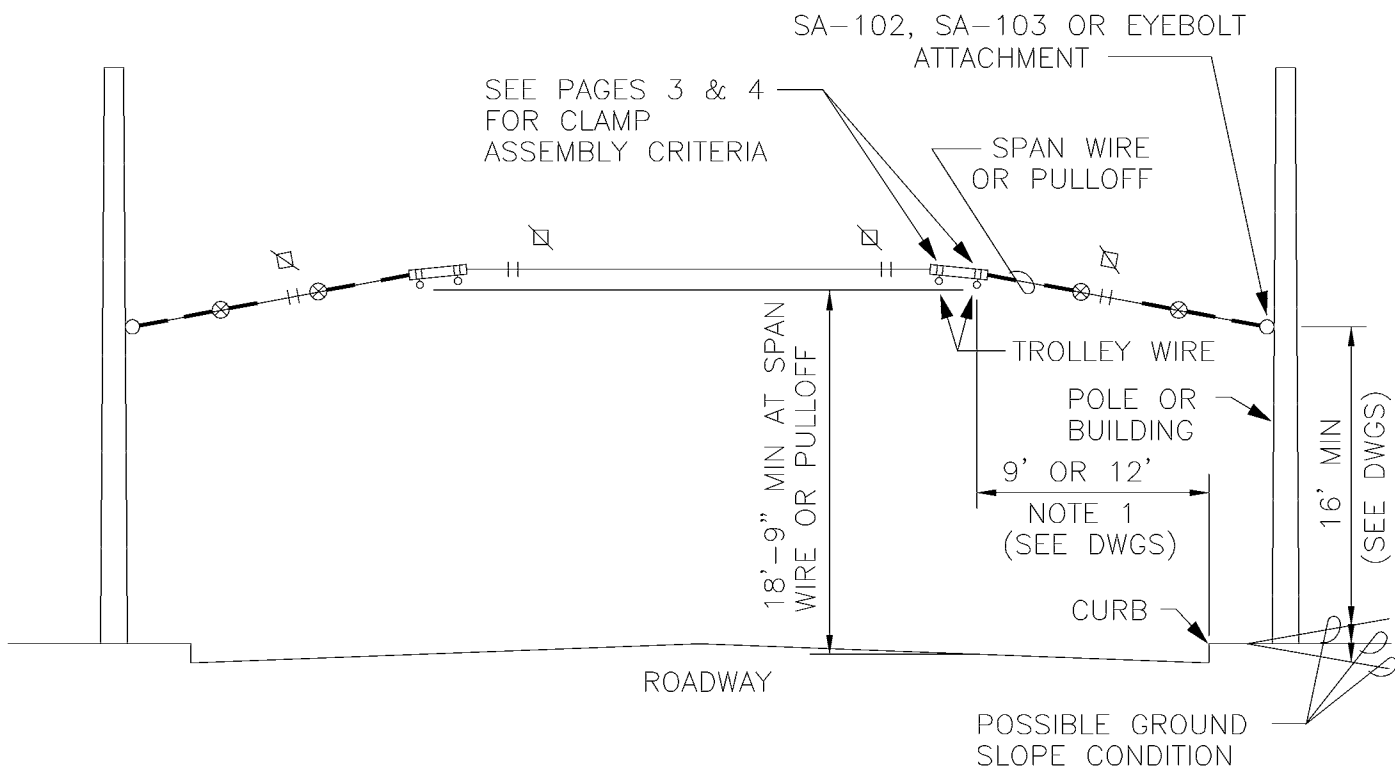
DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

OVERHEAD SPECIALWORK
SWITCH CONTACTOR
CONFIGURATION

DATE: JUN 95
FILE
DWG. NO. SA-163
SHT 1 OF 1



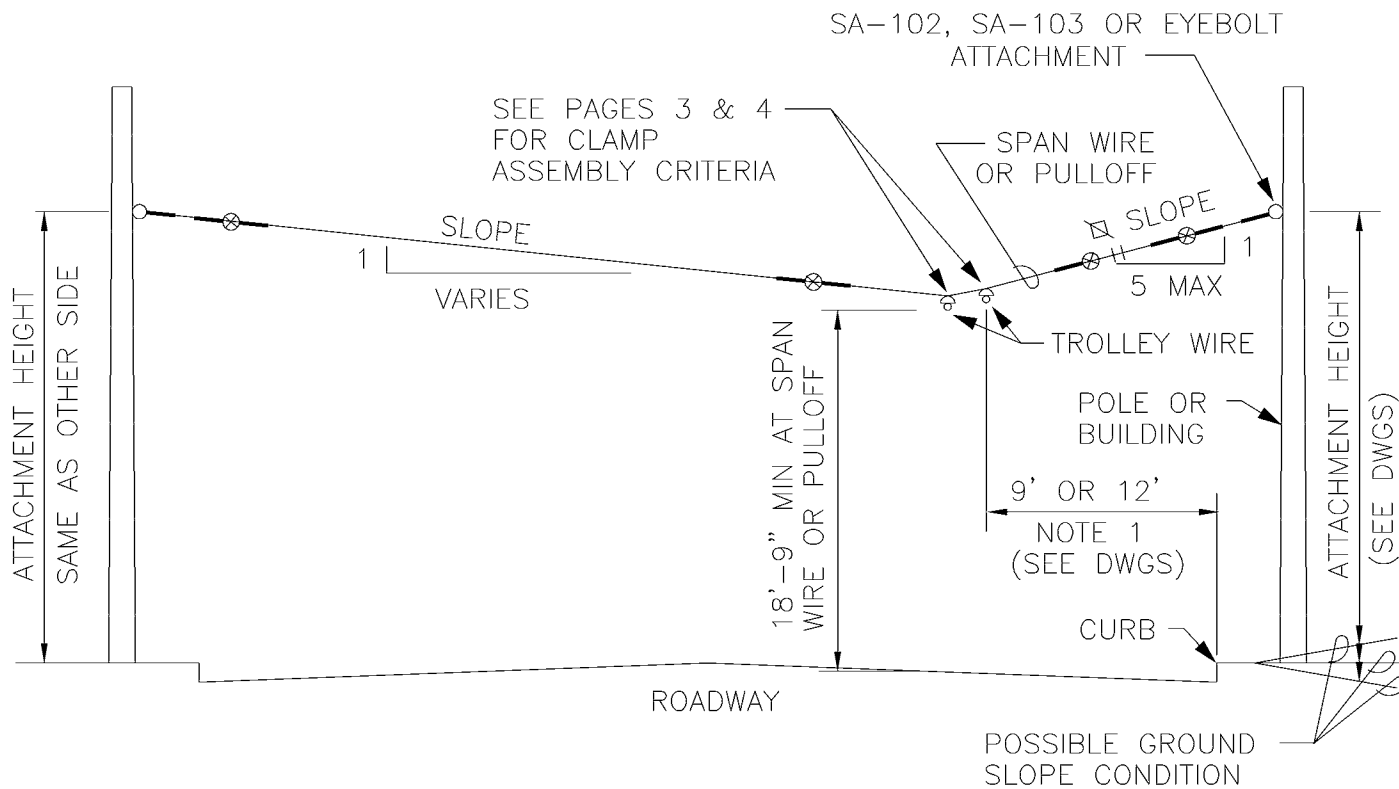
TWO-WAY TANGENT SPAN



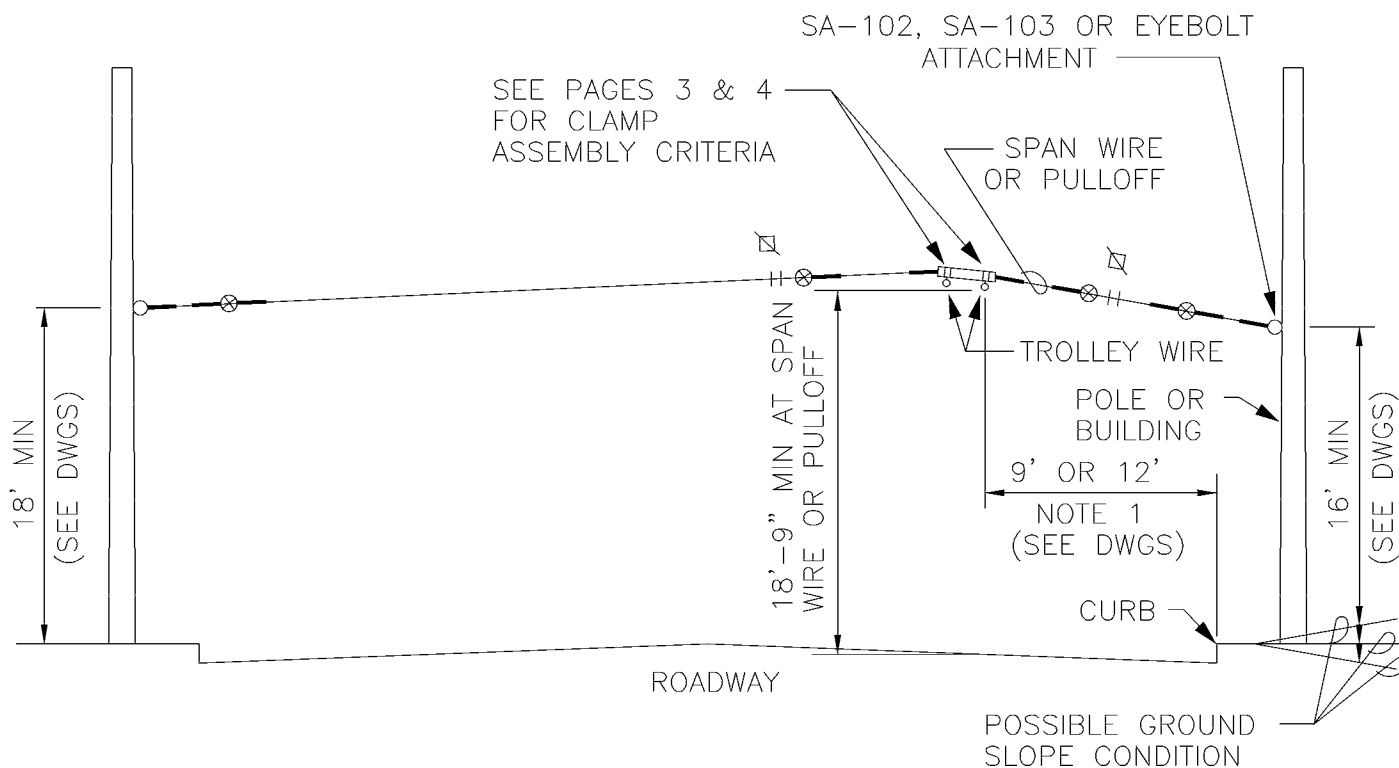
TWO-WAY INVERTED SPAN

V:\Library & Standards\Standards\Trolley\Details\SA-164.1-4.dwg, SA-164.1, 1/5/2007 12:19:08 PM

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS TROLLEY WIRE SUPPORT SPAN ATTACHMENT CRITERIA	DATE: MARCH 00
DR: DOW	SCALE: 1"=10'			FILE
RECOM.	CONTRACT:			DWG. NO. SA-164
APPROVED				SHT 1 OF 4



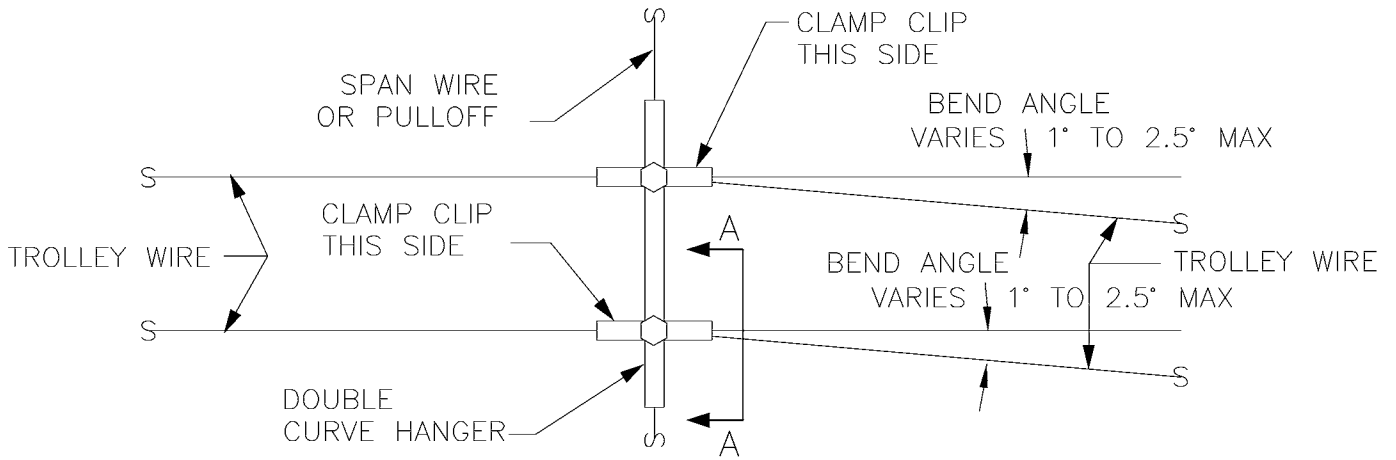
ONE-WAY TANGENT SPAN



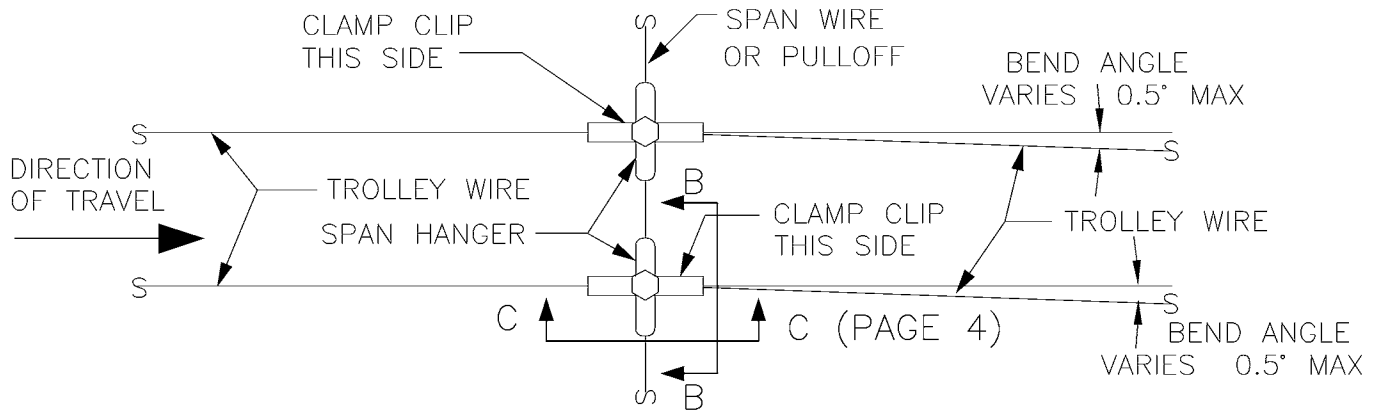
ONE-WAY INVERTED SPAN

V:\Library & Standards\Standards\Trolley\Details\SA-164.1-4.dwg, SA-164.2, 1/5/2007 12:19:14 PM

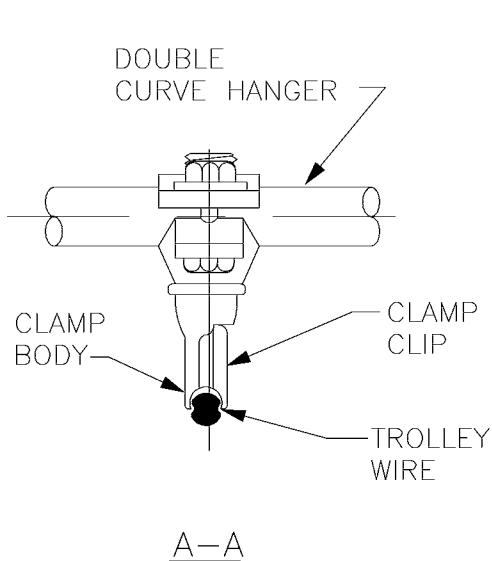
DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS TROLLEY WIRE SUPPORT SPAN ATTACHMENT CRITERIA	DATE: MAR 00
DR: DOW	SCALE: 1"=10'			FILE
RECOM.	CONTRACT:			DWG. NO. SA-164
APPROVED				SHT 2 OF 4



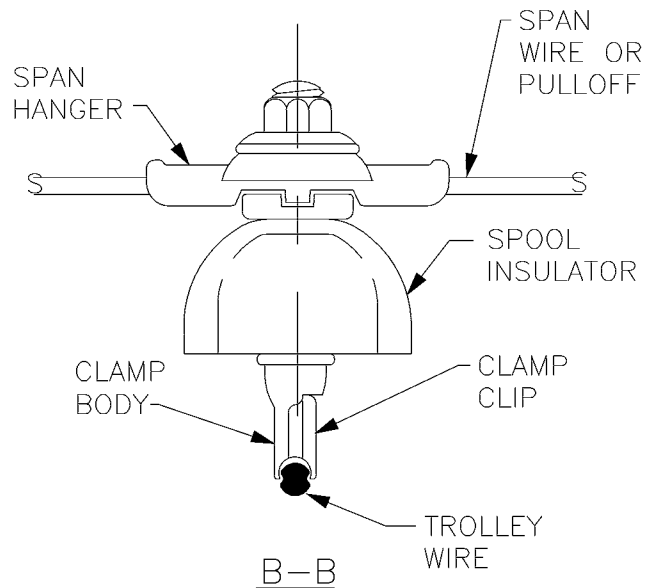
DOUBLE CURVE HANGER SPAN



TANGENT SPAN WITH CURVATURE



A-A



B-B

CLAMP ASSEMBLY CRITERIA

V:\Library & Standards\Standards\Trolley\Details\SA-164.1-4.dwg, SA-164.3, 1/5/2007 12:19:20 PM

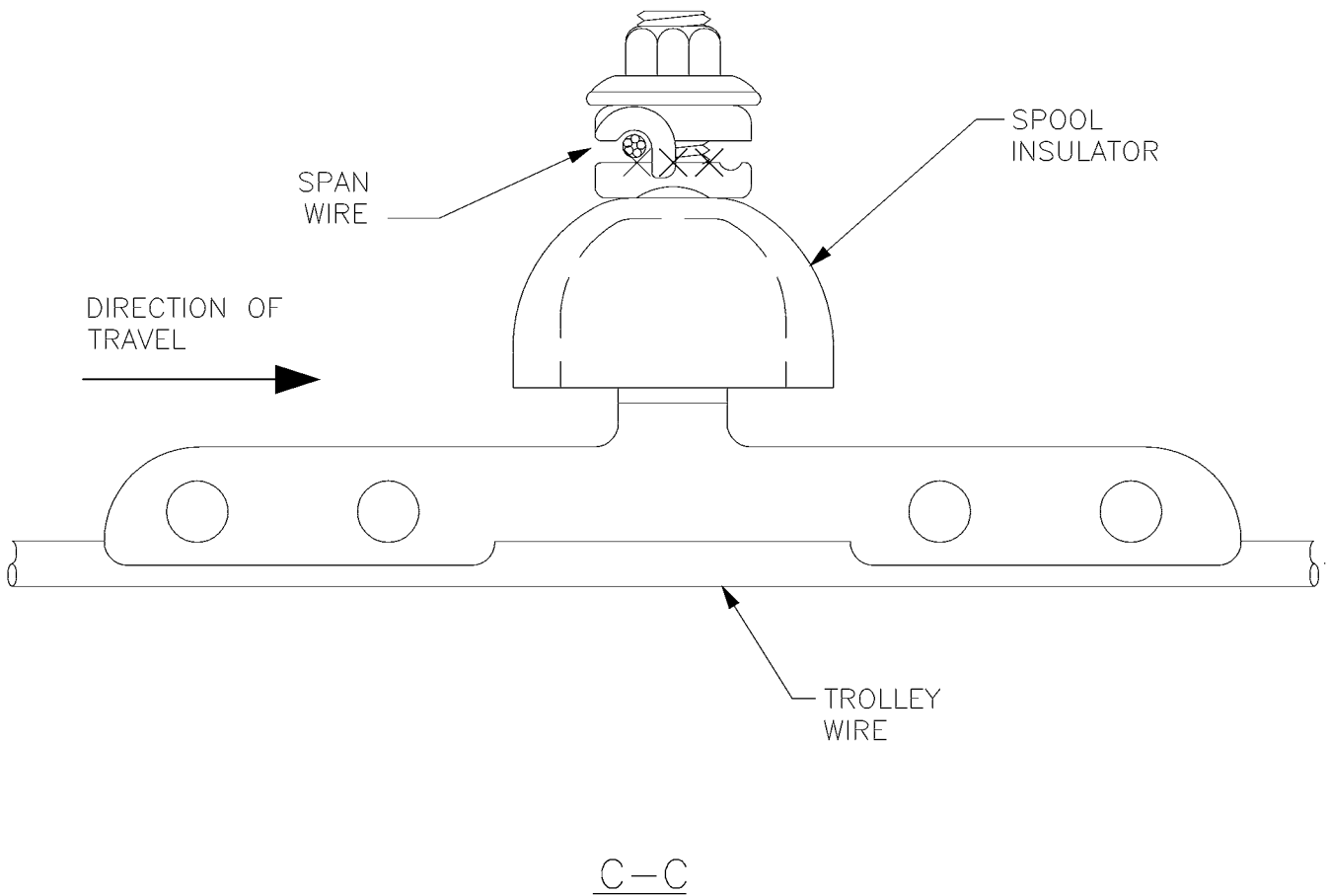
DESIGNED DPG	CHKD: DOW
DR: TMB	SCALE: NONE
RECOM.	CONTRACT:
APPROVED	



DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

TROLLEY WIRE
SUPPORT SPAN
ATTACHMENT CRITERIA

DATE: OCT 95
FILE
DWG. NO. SA-164
SHT 3 OF 4

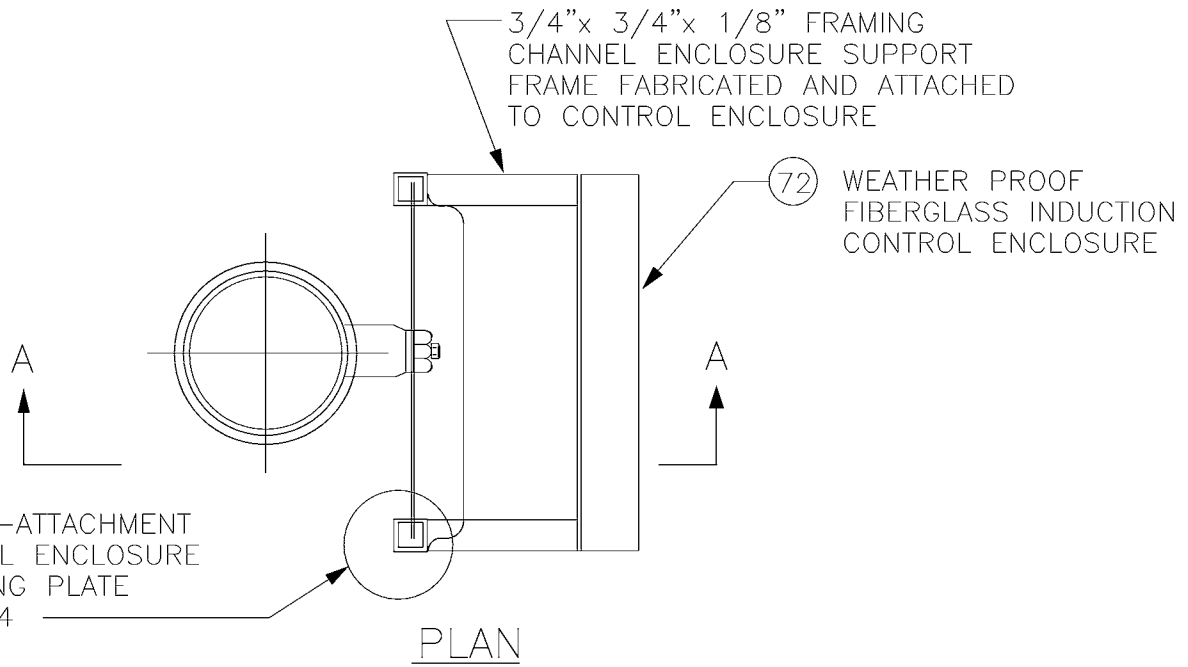


NOTES

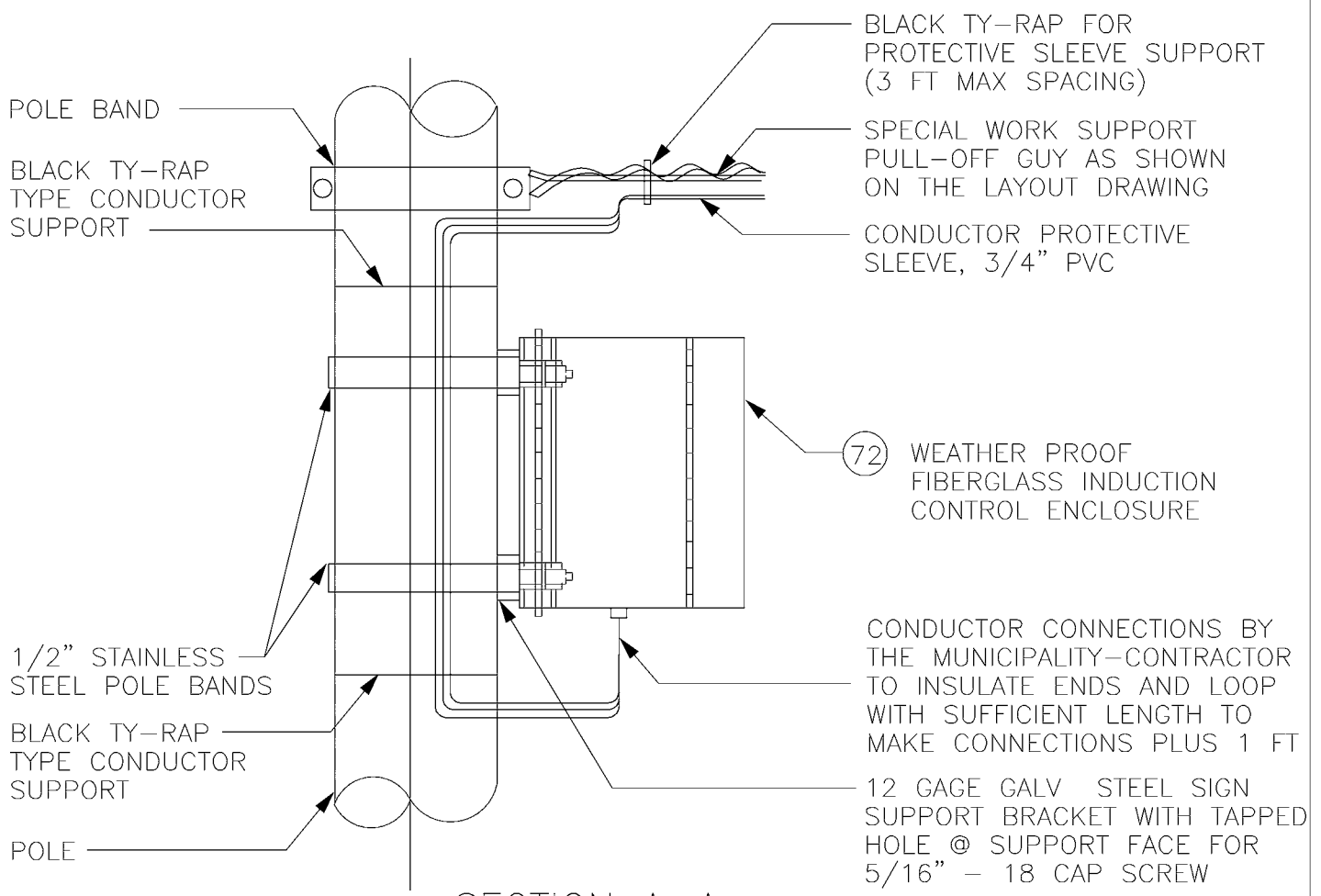
1. 9' IS NORMAL FOR EXTENDED ZONES OF TANGENT SPANS WHERE NO PARKING IS ALLOWED. 12' IS NORMAL FOR EXTENDED ZONES OF TANGENT SPANS WHERE PARKING IS ALLOWED.

V:\Library & Standards\Standards\Trolley\Details\SA-164.1-4.dwg, SA-164.4, 1/5/2007 12:19:26 PM

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JUN 95
DR: TMB	SCALE: NONE		TROLLEY WIRE SUPPORT SPAN	FILE
RECOM.	CONTRACT:		ATTACHMENT CRITERIA	DWG. NO. SA-164
APPROVED				SHT 4 OF 4



PLAN

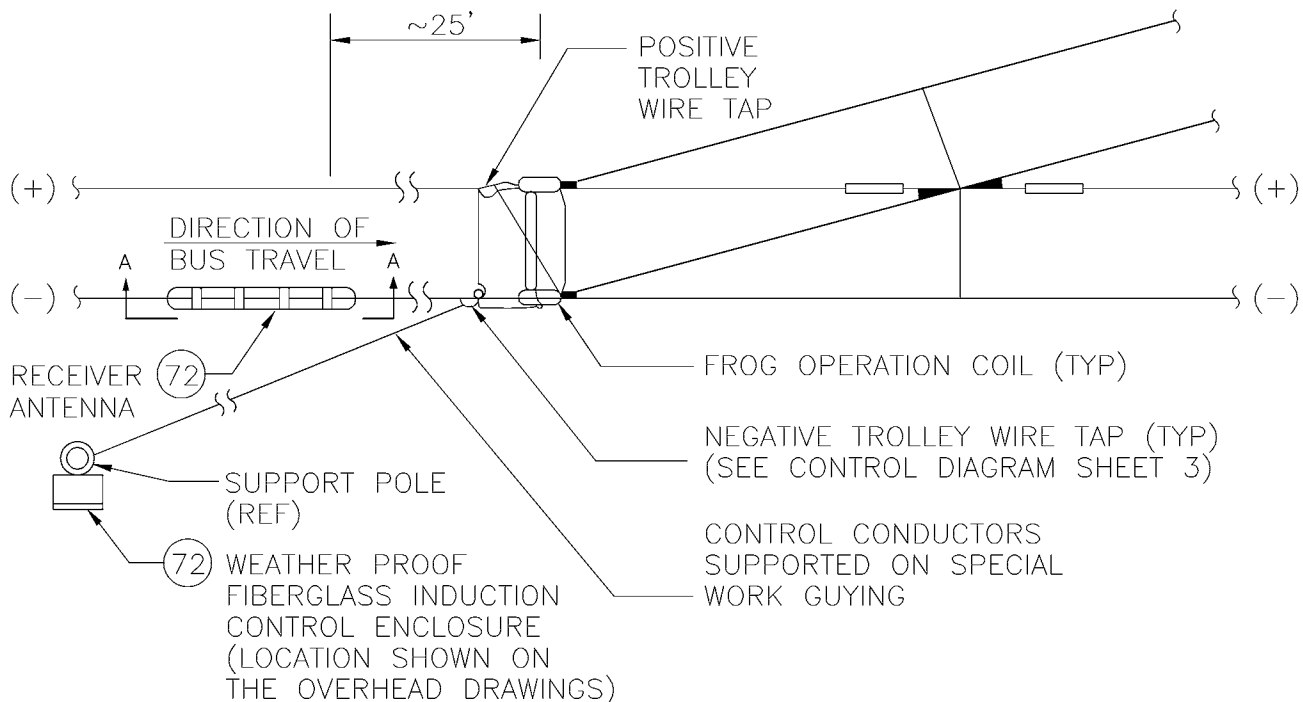


SECTION A-A

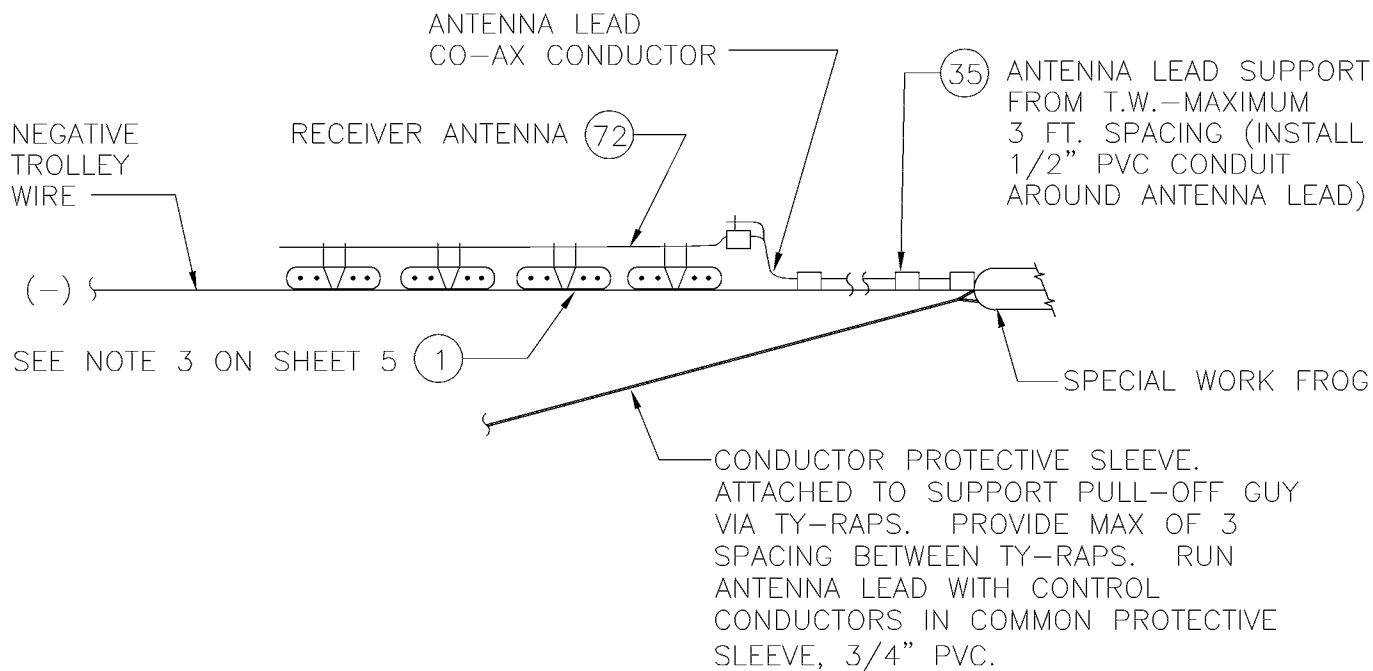
INDUCTION CONTROL ENCLOSURE POLE ASSEMBLY

V:\Library & Standards\Standards\Trolley\Details\SA-165.1, 1/5/2007 12:19:35 PM

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: CMS	SCALE: NONE			FILE
RECOM.	CONTRACT:		FROG INDUCTION CONTROL SYSTEM	DWG. NO. SA-165
APPROVED				SHT 1 OF 6

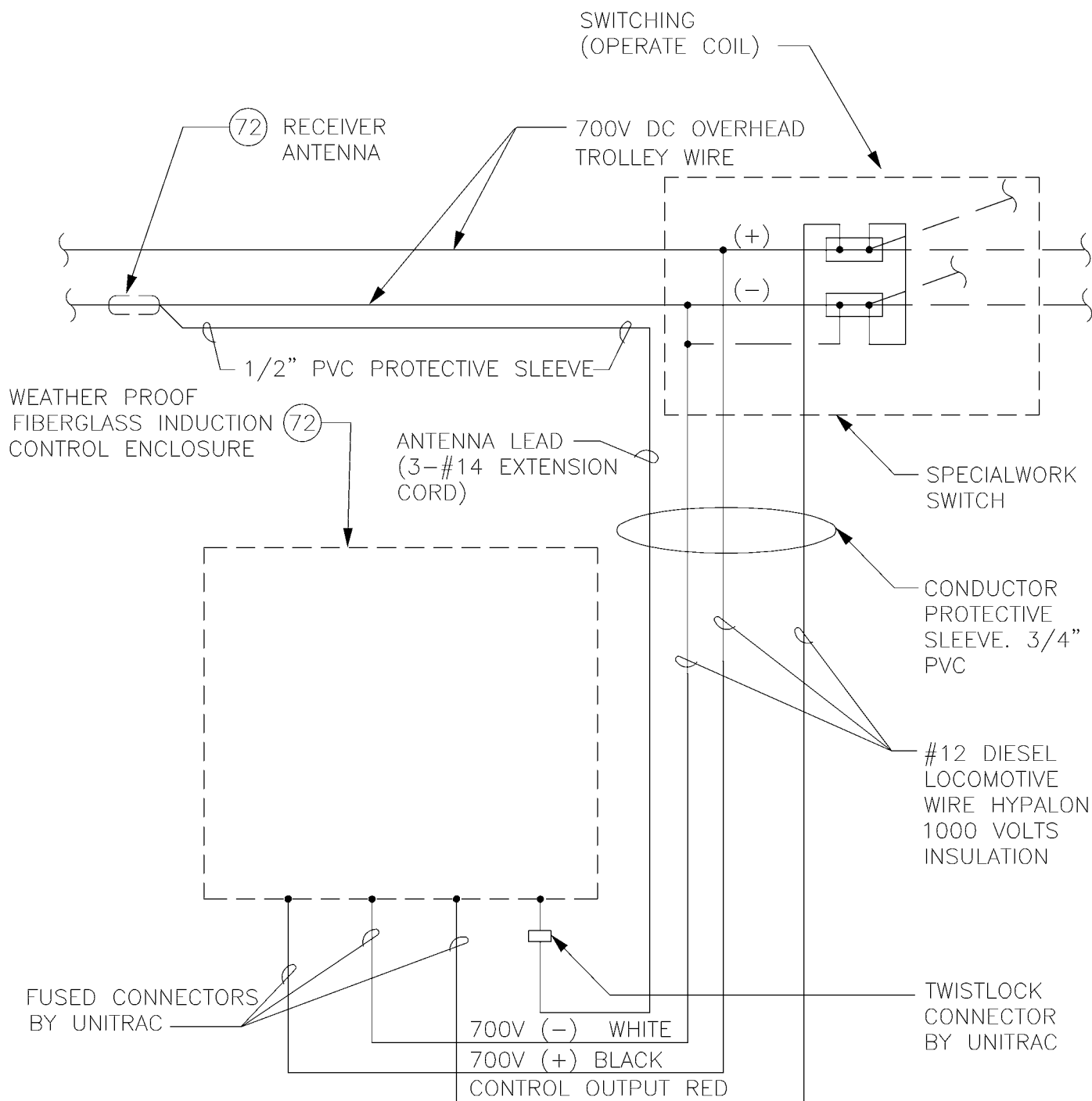


FROG INDUCTION CONTROL ASSEMBLY PLAN

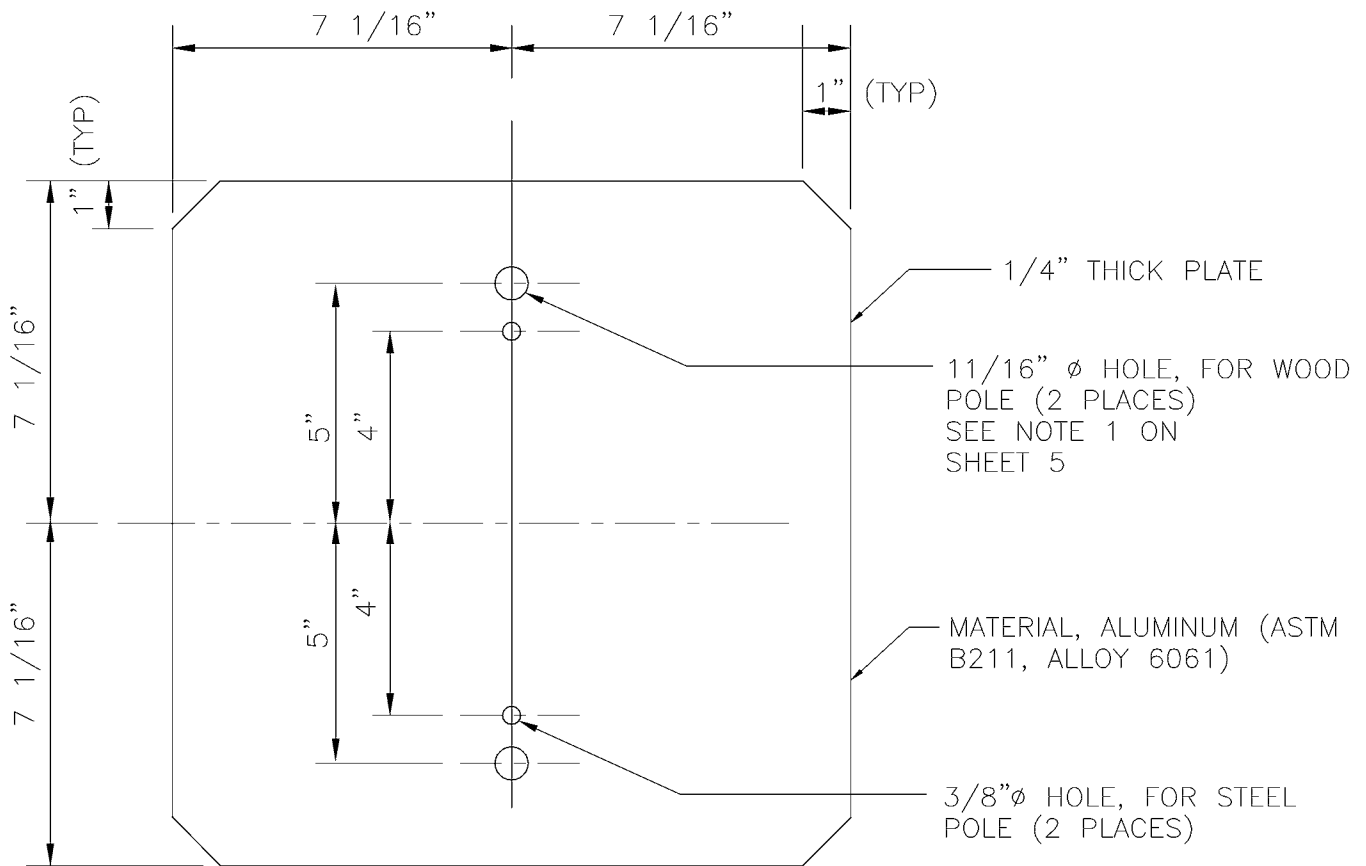


SECTION A-A

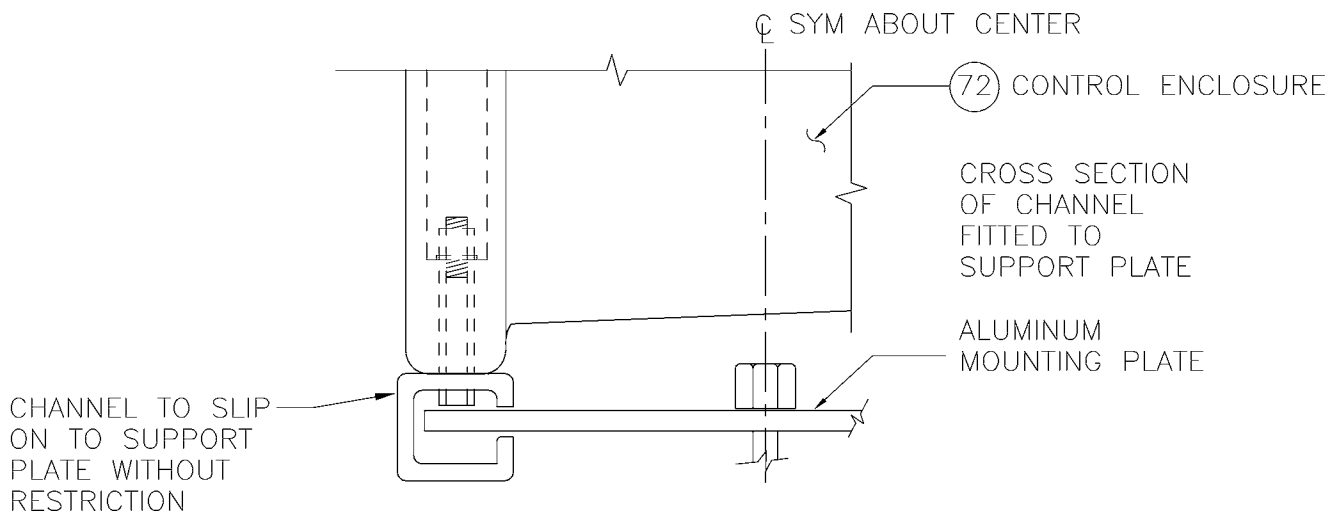
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS FROG INDUCTION CONTROL SYSTEM	DATE: OCT 95
DR: CMS	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-165
APPROVED				SHT 2 OF 6



INDUCTION SYSTEM CONTROL DIAGRAM



ALUMINUM MOUNTING PLATE DETAIL



DETAIL-ATTACHMENT OF CONTROL ENCLOSURE TO MOUNTING PLATE

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS FROG INDUCTION CONTROL SYSTEM	DATE: OCT 95
DR: CMS	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-165
APPROVED				SHT 4 OF 6

GENERAL NOTES

1. WHERE THE SUPPORT POLE IS WOOD, THE CONTROL ENCLOSURE MOUNTING PLATE SHALL BE ATTACHED DIRECTLY TO THE POLE BY MEANS OF ONE HOT-DIP GALVANIZED 5/8-INCH DIAMETER HEX HEAD THROUGH BOLT WITH ATTACHMENT NUT AND WASHER MOUNTED THROUGH THE TOP HOLE OF THE SUPPORT PLATE AND ONE HOT-DIP GALVANIZED 5/8-INCH BY 6-INCH GIMLET POINT HEX HEAD LAG SCREW MOUNTED THROUGH THE BOTTOM HOLE OF THE SUPPORT PLATE.
2. THE CONTROL ENCLOSURE SHALL BE LOCATED IN PROXIMITY OF THE PULL-OFF CABLE ATTACHMENTS AT THE SUPPORT POLE. THE ENCLOSURE SHALL, AS PRACTICAL, BE LOCATED AT THE SIDE OF THE POLE FACING THE CURB. THE ENCLOSURE MAY BE INSTALLED EITHER ABOVE OR BELOW THE PULL-OFF GUY CABLE ATTACHMENT AT THE POLE, AS SUITABLE, TO PREVENT CONFLICT WITH OTHER ATTACHMENTS TO THE POLE. THE ENCLOSURE SHALL BE SO LOCATED ON THE POLE THAT CONFLICTS WILL NOT BE INTRODUCED TO ACCESSIBILITY OF EXISTING UTILITIES AND POLE CLIMBING SPACES. ON JOINT USE POLES HAVING A CROSS-ARM, THE ENCLOSURE SHALL BE MOUNTED ON THE CROSS-ARM TO PREVENT CONFLICT WITH CLIMBING SPACE. WHERE A JOINT USE POLE IS WITHOUT A CROSS-ARM, THE CONTRACTOR SHALL COORDINATE ENCLOSURE MOUNTING SPACE WITH THE JOINT USE OWNERS OF THE POLE.
3. THE HOLES FORMED IN THE ANTENNA WEB FOR MOUNTING OF THE ANTENNA MAY BE ENLARGED TO ACCOMMODATE THE 5/8-INCH DIAMETER BOLTS REQUIRED FOR ANTENNA ATTACHMENT TO THE SUPPORTING TROLLEY WIRE CLAMPS.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
35	AS REQD	CLAMP, INSUL LEAD WIRE	WABCO	19655-2000
72	1	INDUCTIVE CONTROL SYSTEM RECEIVER	UNITRAC	320100-16X
07	1	INDUCTIVE CONTROL SYSTEM ANTENNA	UNITRAC	320310-4X

DESIGNED
DPG

CHKD:
DOW

DR:
CMS

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

FROG INDUCTION
CONTROL SYSTEM

DATE:
OCT 95

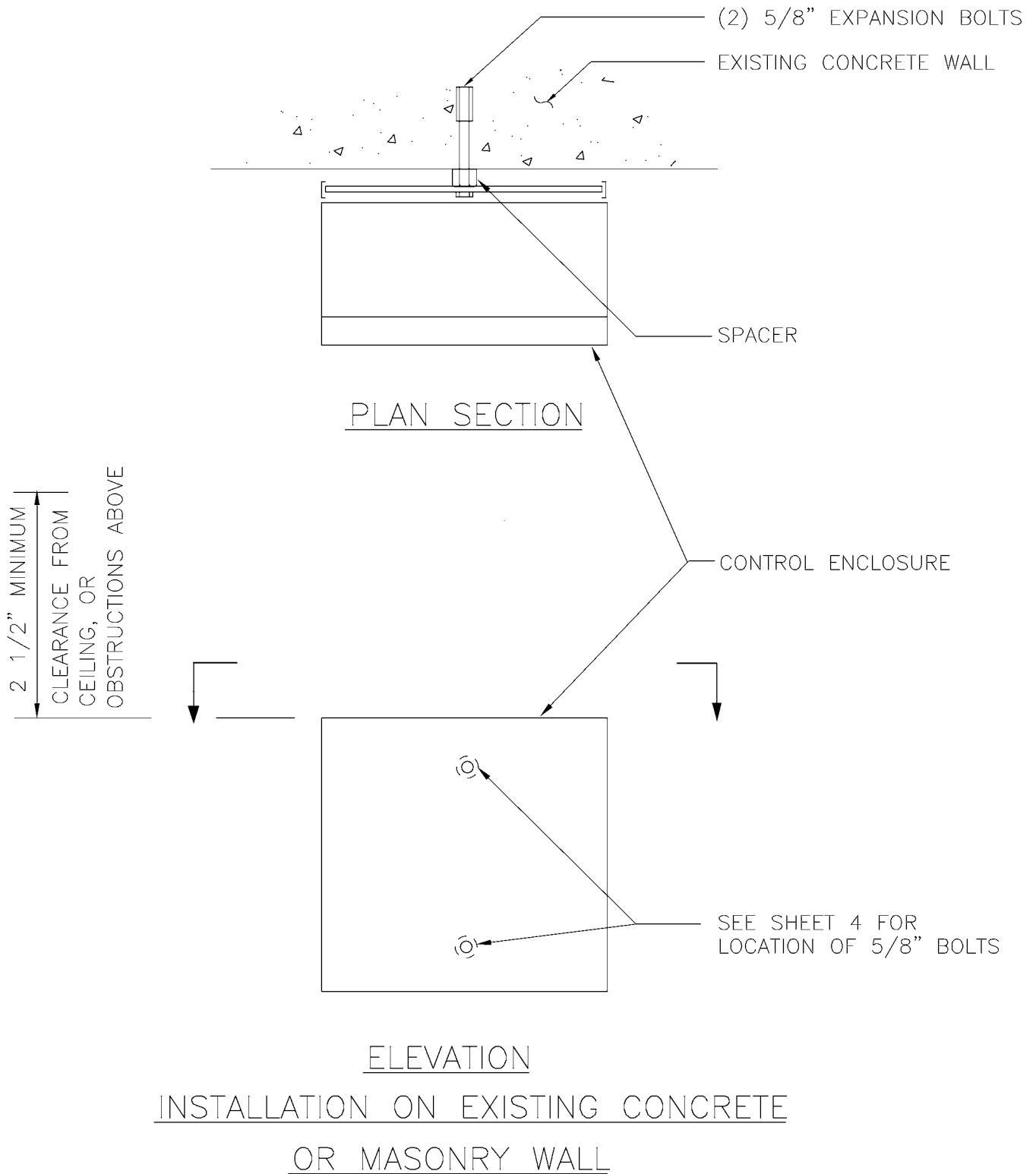
FILE

DWG. NO.

SA-165

SHT 5 OF 6

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DESIGNED
DPG

CHKD:
DOW

DR:
CMS

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

FROG INDUCTION
CONTROL SYSTEM

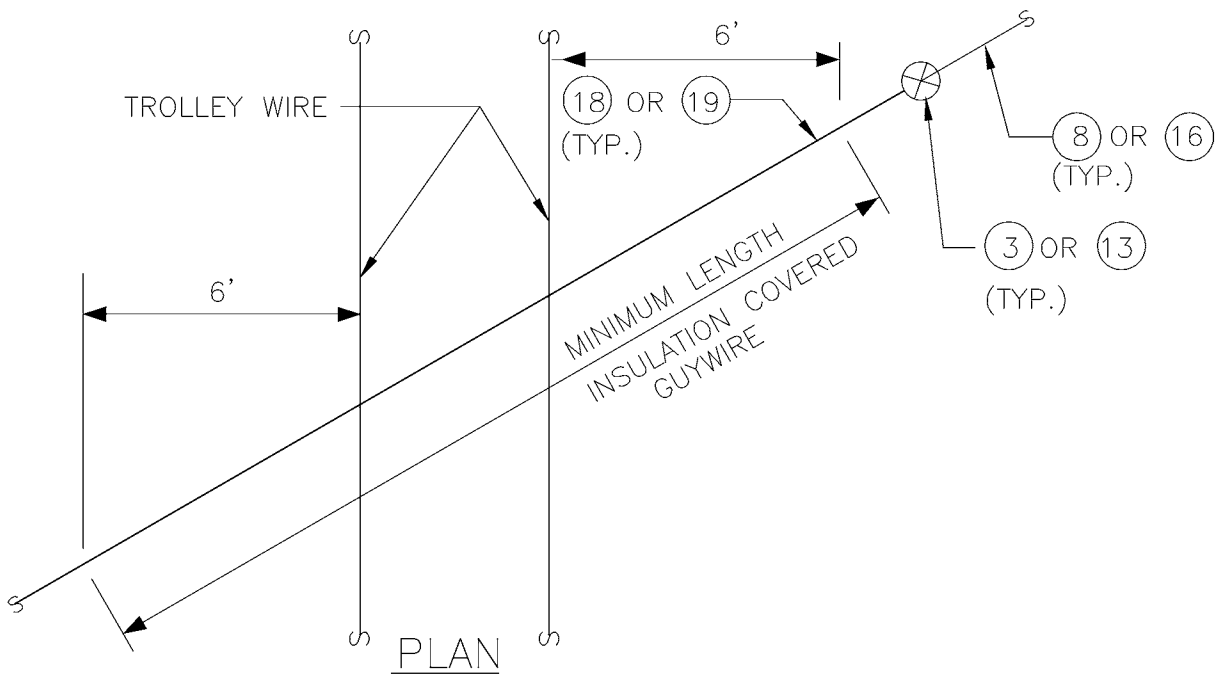
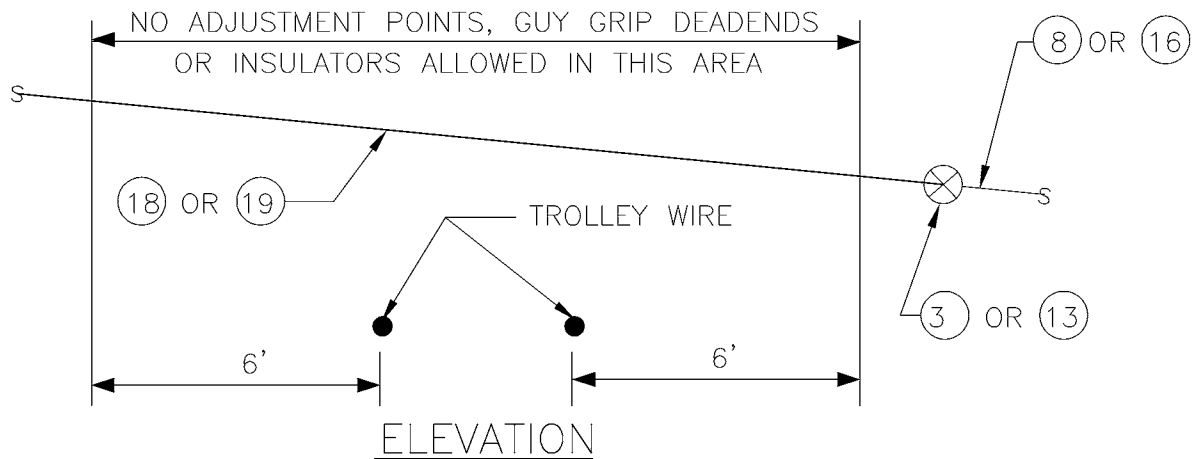
DATE:
OCT 95

FILE

DWG. NO.

SA-165

SHT 6 OF 6



NOTES:

1. THE ENGINEER SHALL CONCUR WITH ANY EXCEPTIONS TO THESE CRITERIA.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
08	VARIES	GUY STRAND	COPPERWELD	8M
13	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
16	VARIES	GUY STRAND	COPPERWELD	16M
18	VARIES	GUY STRAND, COVERED	COPPERWELD	8MI
19	VARIES	GUY STRAND, COVERED	COPPERWELD	16MI

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

INSULATION COVERED
GUY WIRE
REQUIREMENT CRITERIA

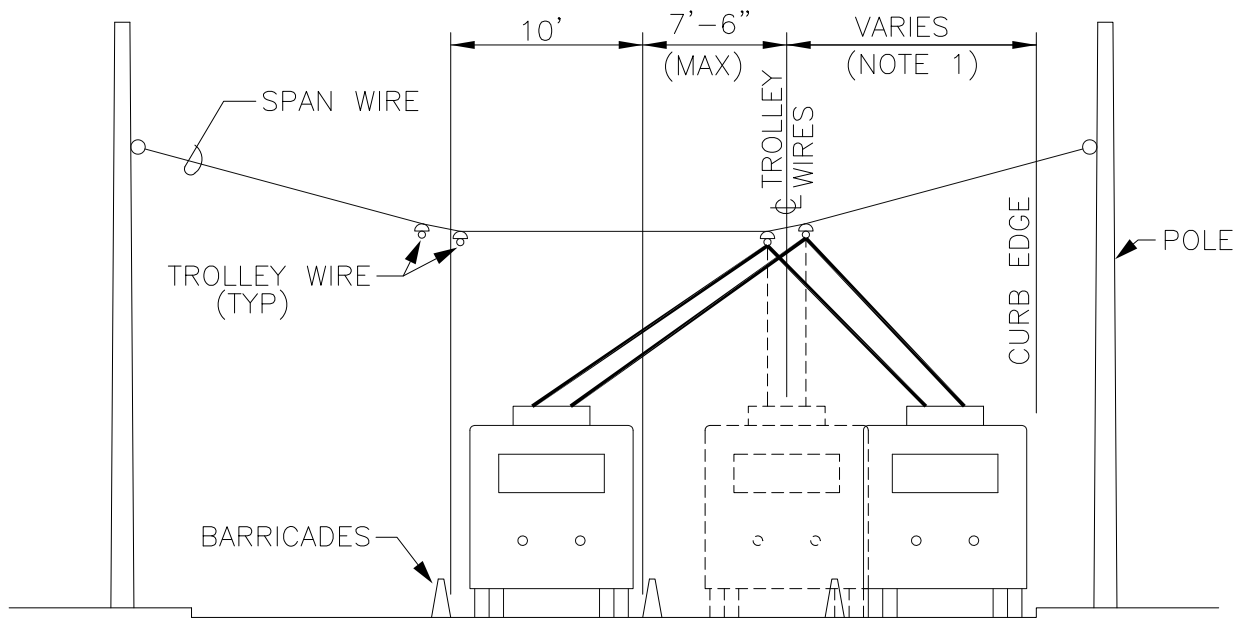
DATE:
OCT 95

FILE

DWG. NO.

SA-167

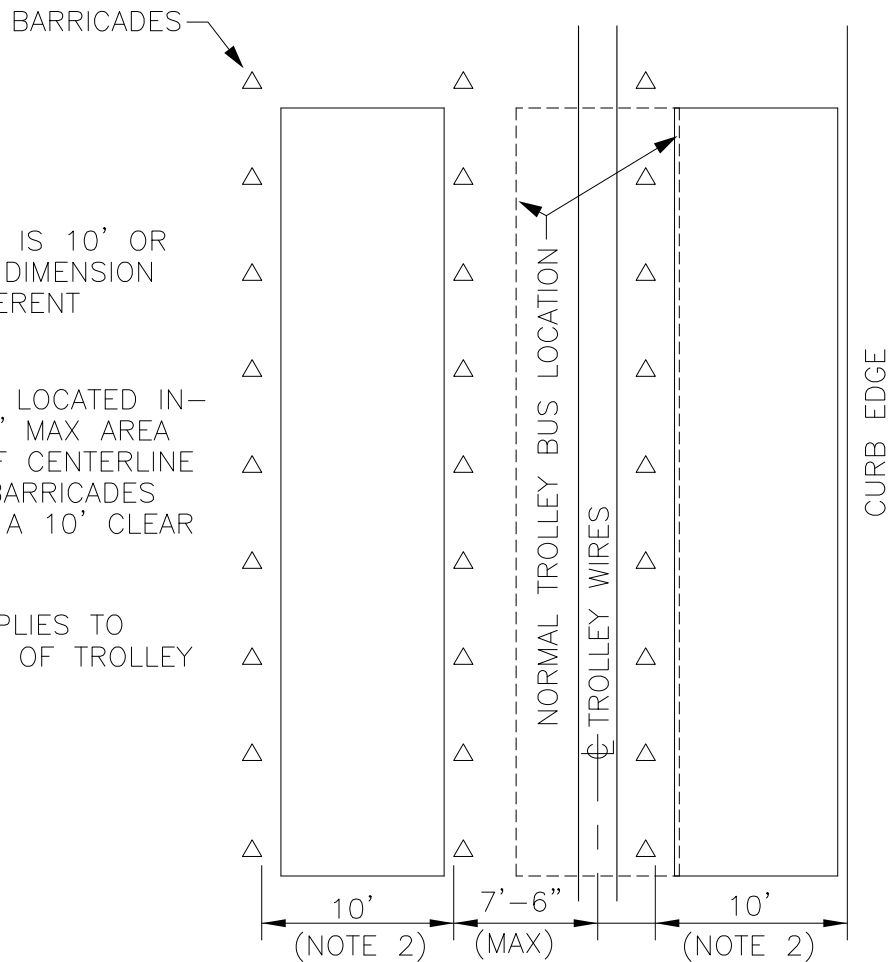
SHT 1 OF 1



ELEVATION

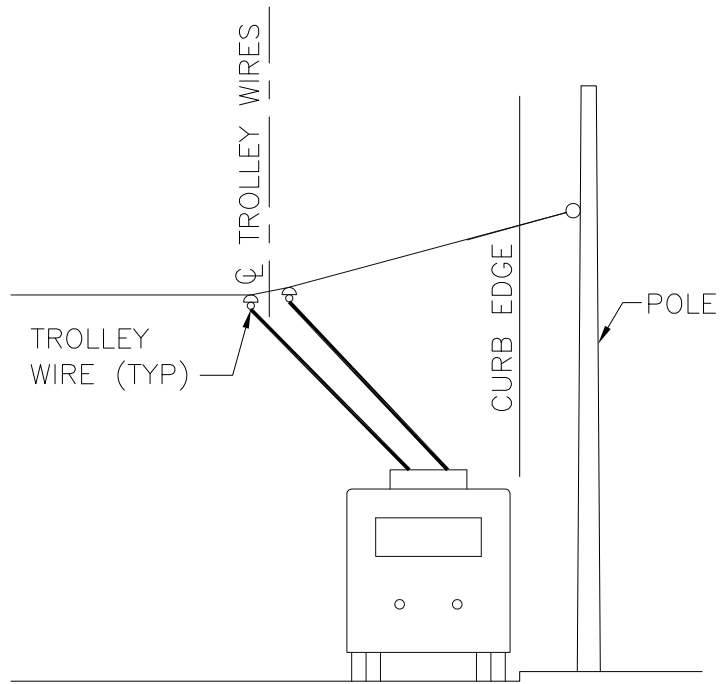
NOTES:

1. NORMAL DIMENSION IS 10' OR 13', BUT EXISTING DIMENSION WILL VARY AT DIFFERENT LOCATIONS.
2. BARRICADES TO BE LOCATED INSIDE OF THE 7'-6" MAX AREA ON EITHER SIDE OF CENTERLINE TROLLEY WIRES. BARRICADES SHALL ALSO FORM A 10' CLEAR TRAVEL LANE.
3. THIS STANDARD APPLIES TO STRAIGHT SECTIONS OF TROLLEY WIRE ONLY.

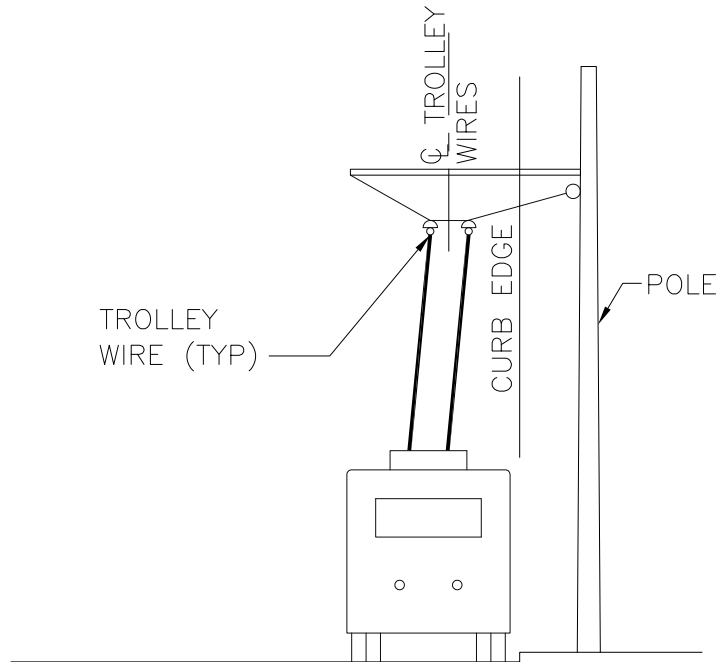


PLAN

DESIGNED RR	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS TROLLEY COACH TRAVEL AREA IN CONSTRUCTION ZONE	DATE: NOV 93
DR: DOW	SCALE: 1"=10'			FILE
RECOM.	CONTRACT:			DWG. NO. SA-170
APPROVED				SHT 1 OF 1

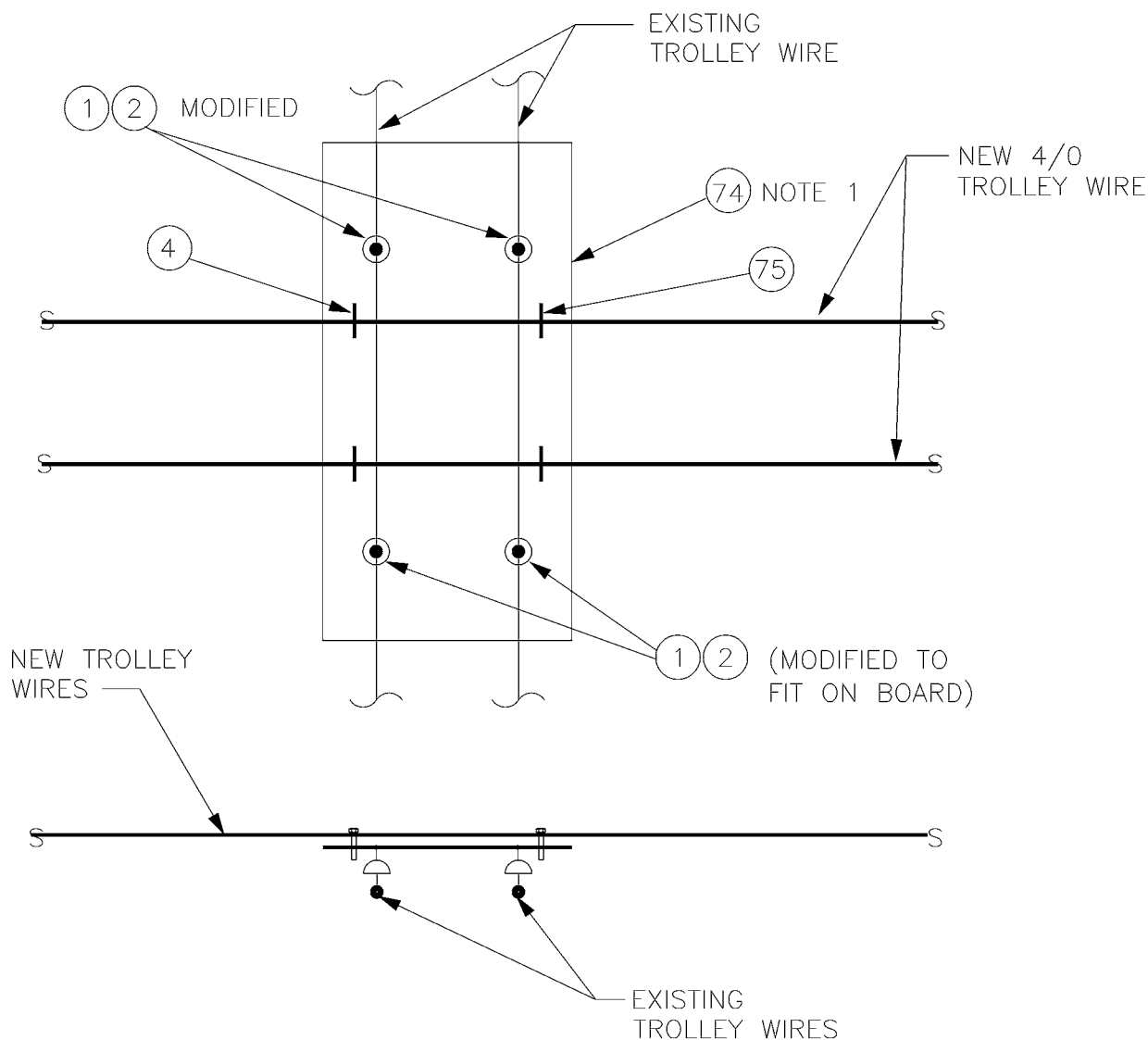


POLE SPAN SUPPORT



MAST ARM SUPPORT

DESIGNED AW	CHKD: AW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS TROLLEY COACH ELEVATION VIEW WITH SPANS OR MAST ARM	DATE: FEB 08
DR: BFB	SCALE: 1"=10'			FILE
RECOM.	CONTRACT:			DWG. NO. SA-171
APPROVED				SHT 1 OF 1



NOTES:

1. 4' x 8' SIZE IS A MINIMUM. USE 2 OR MORE WHEN REQUIRED.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
02	4	AGC TANGENT SPAN HANGER	WABCO	19360-2000
74	1	4' X 8' X 1/2" EXTERIOR PLYWOOD		
75	4	U BOLT, FOR 4/0 TROLLEY WIRE		

DESIGNED
DOW

DR:
TMB

RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

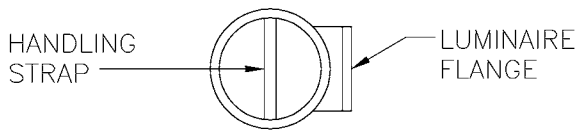
TEMPORARY
INSULATION BOARD

DATE:
JUN 95

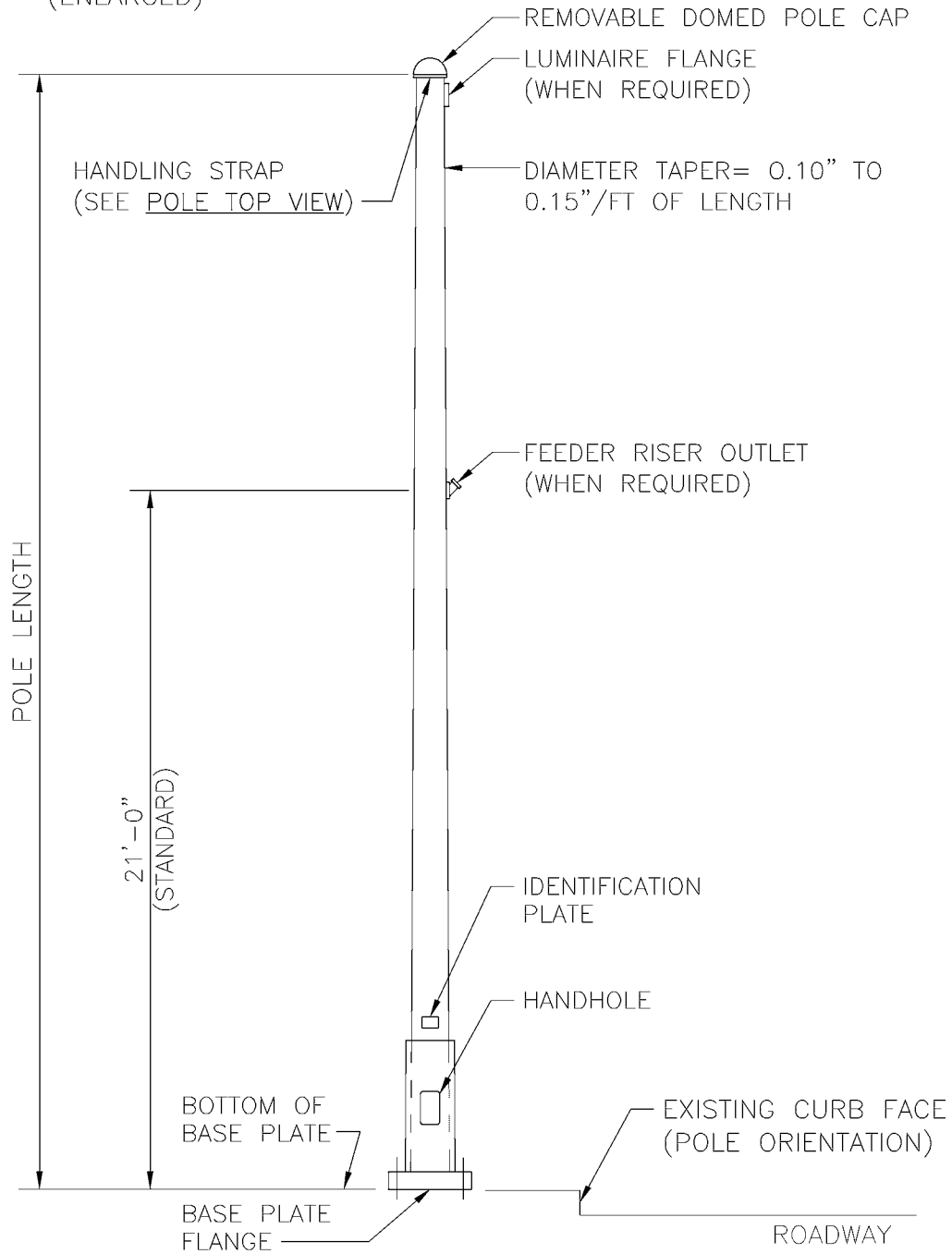
FILE

DWG. NO.
SA-190

SHT 1 OF 1



POLE TOP VIEW
(ENLARGED)



ANCHOR BASE STEEL POLE

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DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NTS

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STANDARD STEEL POLE

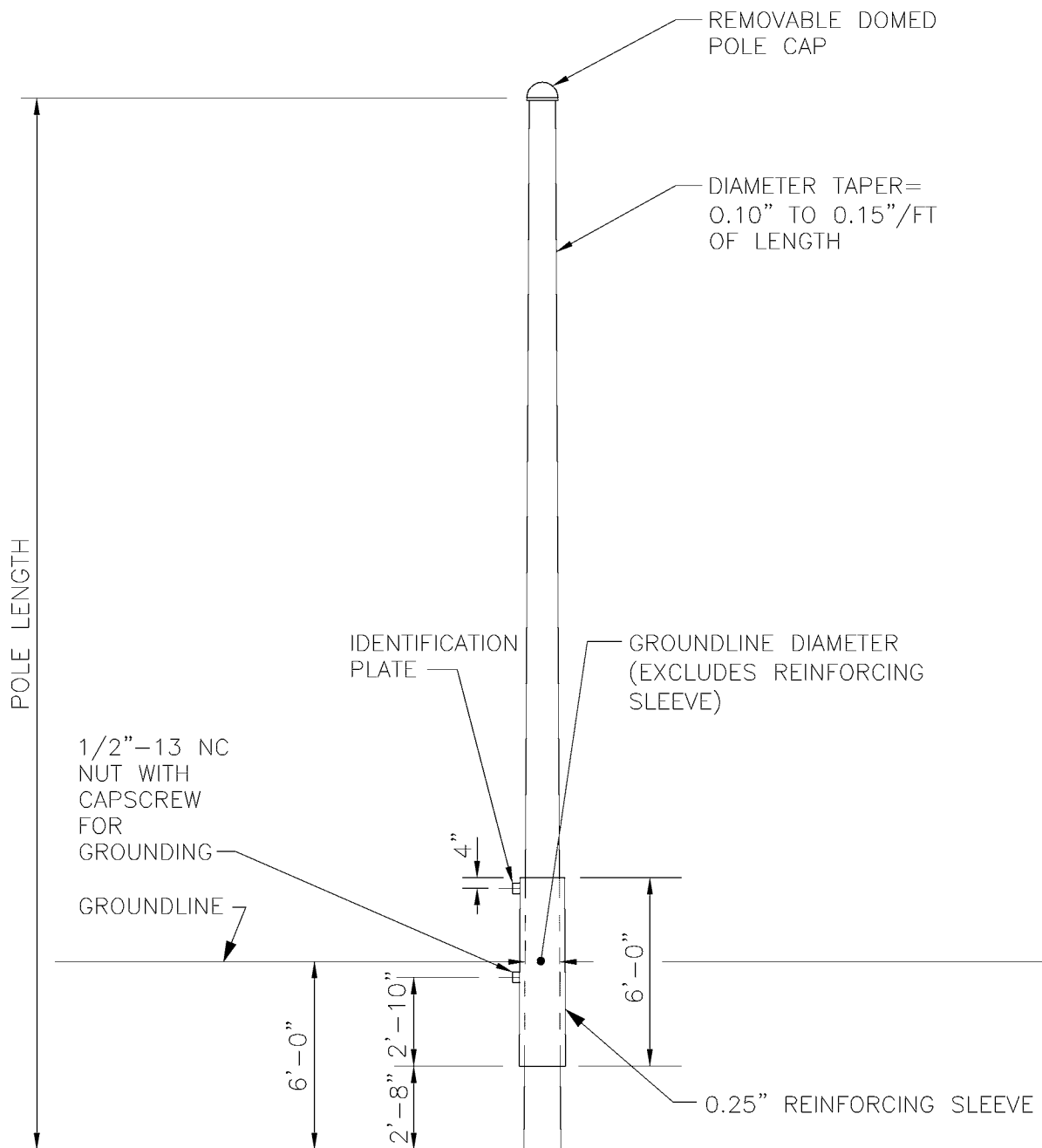
DATE:
JAN 97

FILE

DWG. NO.

SA-201

SHT 1 OF 4



EMBEDDED STEEL POLE

V:\Library & Standards\Standards\Trolley\Details\SA-201.1-4.dwg, SA-201-2, 1/5/2007 12:20:34 PM

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STANDARD STEEL POLE	DATE: JAN 97
DR: TMB	SCALE: NTS			FILE
RECOM.	CONTRACT:			DWG. NO. SA-201
APPROVED				SHT 2 OF 4

POLE SCHEDULE OF ALLOWABLE LOADS

ALLOWABLE TROLLEY OVERHEAD LOADS ON POLES AT 60° F WITH TROLLEY WIRE
TENSION = 2000 LB. (EQUIVALENT HORIZONTAL LOAD IS APPLIED AT 25 FT)

POLE TYPE	ALLOWABLE LOADS				REFERENCE DATA				
	POLE USERS: TOH/LIGHT		POLE USERS: TOH/LIGHT/TRAFFIC		POLE STYLE	STANDARD LENGTH (FEET)	GRD LINE DIA (IN)	GROUND LINE YIELD MOMENT (LB-FT)	POLE FOUNDATION TYPE
	GROUND LINE MOMENT (LB-FT) (NOTE 1)	EQUIVALENT LOAD (LB)	GROUND LINE MOMENT (LB-FT) (NOTE 1,2)	EQUIVALENT LOAD (LB)					
SA-201H	40,000	1600	10,000	400	EMBEDDED	35	12	100,000	SA-212B
SA-201K	80,000	3200	50,000	2000			14	180,000	SA-212D
SA-201M	155,000	6200	125,000	5000			15	330,000	SA-212F
SA-201V	40,000	1600	10,000	400	ANCHOR BASE	33.5	12	100,000	SA-213B
SA-201X	80,000	3200	50,000	2000			14	180,000	SA-213D
SA-201Z	155,000	6200	125,000	5000			15	330,000	SA-213F
SA-201ZZ	185,000	7400	155,000	6200			15	390,000	SA-213F
SA-201V	40,000	1600	10,000	400	W/ CHIEF ANCHOR BASE SEATTLE BASE	28.5	12	100,000	SA-213B
SA-201X	80,000	3200	50,000	2000			12	180,000	SA-213D
SA-201Y	125,000	5000	95,000	3800			12	270,000	SA-213F
SA-201Z	155,000	6200	125,000	5000			12	330,000	SA-213F

NOTES

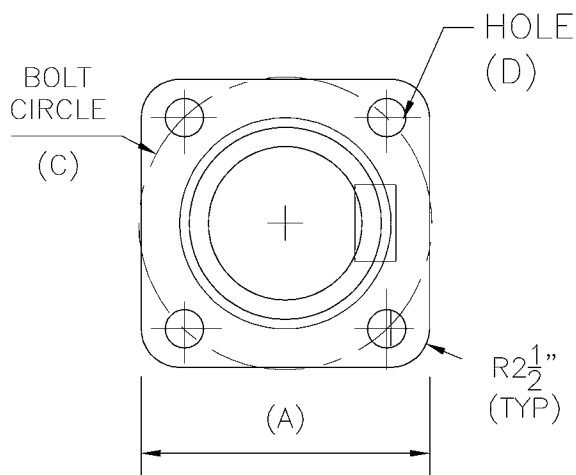
1. REDUCE ALLOWABLE LOADS FOR:

- A. TROLLEY WIRE TENSION OF 1500# AT 60° F 10%
- B. FOR EACH ELECTRIC LINE, COMMUNICATION LINE, OR SERVICE DROP ATTACHED TO POLE EXCEPT AT DEAD ENDS AND ANGLES 5000 LB-FT (200 LB)
- C. DEAD ENDS, ANGLES, AND GUYS FOR ELECTRIC AND COMMUNICATION LINES AND SERVICE DROPS REQUIRE ADDITIONAL REDUCTIONS.

2. REDUCE ALLOWABLE LOADS FOR:

- A. TRAFFIC SPAN WITH OVER 4 HEADS OR SIGNS FOR EACH ADDITIONAL HEAD OR SIGN 6000 LB-FT (240 LB)
- B. 2 TRAFFIC SPANS AT 90° ±10° W/ OVER 5 HEADS OR SIGNS TOTAL FOR EACH ADDITIONAL HEAD OR SIGN 5000 LB-FT (200 LB)
- C. TRAFFIC ARM WITH OVER 4 HEADS OR SIGNS FOR EACH ADDITIONAL HEAD OR SIGN 15000 LB-FT (600 LB)

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STANDARD STEEL POLE	DATE: JAN 97
DR: TMB	SCALE: NTS			FILE
RECOM.	CONTRACT:			DWG. NO. SA-201
APPROVED				SHT 3 OF 4



BASE PLATE FLANGE

BASE PLATE FLANGE DIMENSIONS
(INCHES)

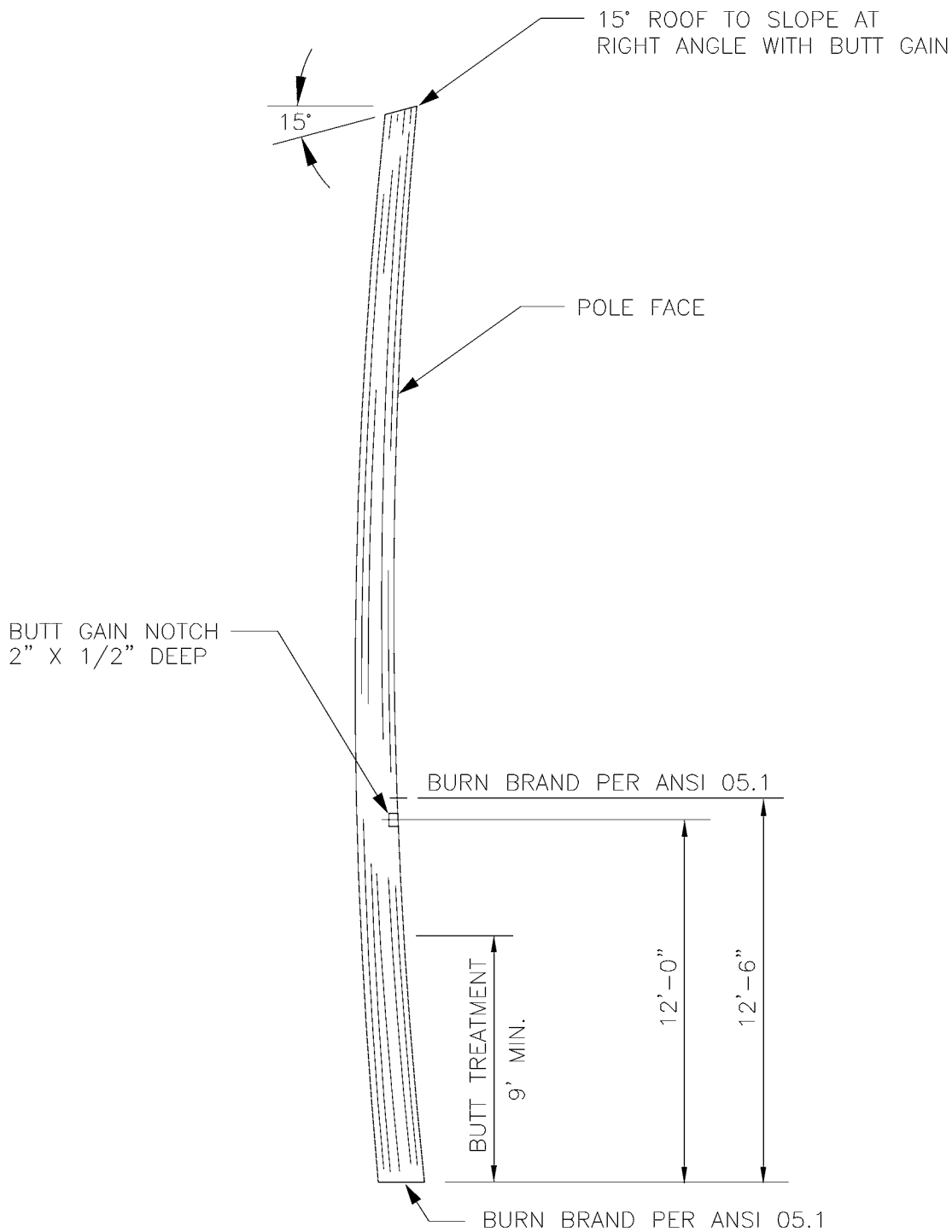
POLE TYPE	PLATE WIDTH (A)	PLATE THICKNESS (B)	BOLT CIRCLE (C)	HOLE DIA (D)
BASE STYLE: STANDARD				
SA-201-V	18x18	1 $\frac{3}{4}$	18	2 $\frac{1}{16}$
SA-201-X	20x20	2	20	2 $\frac{5}{16}$
SA-201-Z	23x23	2 $\frac{1}{2}$	22	2 $\frac{13}{16}$
SA-201-ZZ	23x23	2 $\frac{1}{2}$	22	2 $\frac{13}{16}$
BASE STYLE: CHIEF SEATTLE				
SA-201-V	23x23	1 $\frac{3}{4}$	18	2 $\frac{1}{16}$
SA-201-X	23x23	2	20	2 $\frac{5}{16}$
SA-201-Y	23x23	2 $\frac{1}{4}$	22	2 $\frac{13}{16}$
SA-201-Z	23x23	2 $\frac{1}{2}$	22	2 $\frac{13}{16}$

GENERAL NOTES

1. INSTALLATION:

- A. HANDLING OF POLES SHALL BE DONE ONLY BY THE ANCHOR BOLT HOLES IN THE BASE PLATE, THE HANDLING STRAP AT THE POLE TOP, OR A PAD-EYE BOLTED TO THE POLE TOP PLATE.
- B. POLES SHALL BE STORED AND TRANSPORTED HORIZONTALLY, SUPPORTED BY THE BASE PLATES, AND WITH A NEW SCRAP OF CARPETING WITHIN THE TOP FOOT OF THE POLE.
- C. ZINC REPAIR PAINT SHALL BE AS SPECIFIED IN SECTION 05121 OF THIS CONTRACT.
- D. GALVANIZING REPAIR COMPOUND SHALL BE AS SPECIFIED IN SECTION 05121 OF THIS CONTRACT.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STANDARD STEEL POLE	DATE: JAN 97
DR: TMB	SCALE: NTS			FILE
RECOM.	CONTRACT:			DWG. NO. SA-201
APPROVED				SHT 4 OF 4



NOTES

- POLE SHALL BE CLASS 1, WESTERN RED CEDAR, PER ANSI 05.1—LATEST EDITION.
- METAL TAGS AND NAILS FOR BURN BRAND ARE NOT ALLOWED.

V:\Library & Standards\Standards\Trolley\Details\SA-202-202A.dwg, SA-202, 1/5/2007 12:20:54 PM

DESIGNED DPG	CHKD: DPG
DR: DOW	SCALE: NONE
RECOM.	CONTRACT:
APPROVED	

CHKD: DPG
SCALE: NONE
CONTRACT:

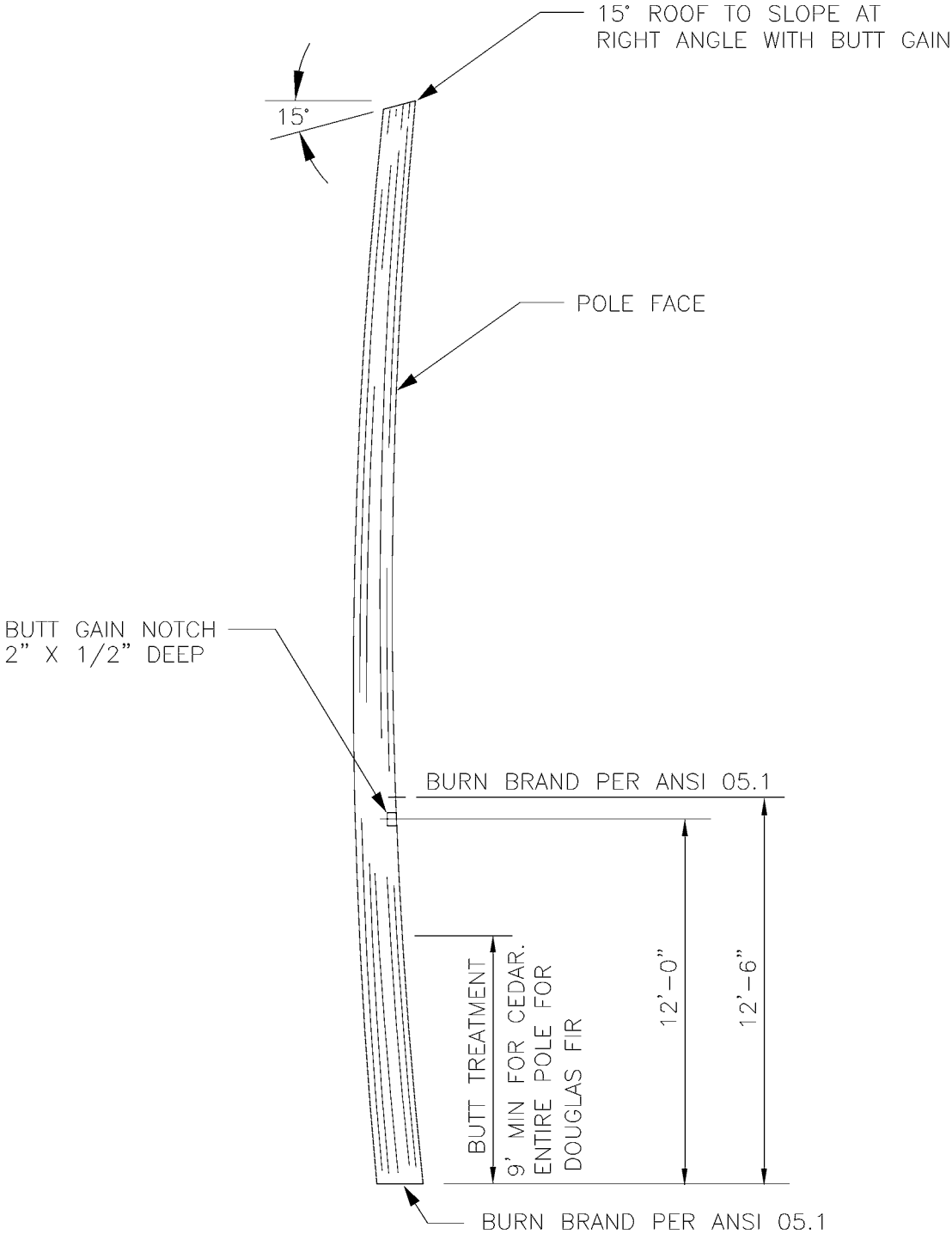


DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

WOOD POLE
FRAMING DETAILS

DATE: MAR 00
FILE
DWG. NO. SA-202
SHT 1 OF 1

V:\Library & Standards\Standards\Trolley\Details\SA-202-202A.dwg, SA-202A, 1/5/2007 12:21:00 PM



NOTES

- 1. POLE SHALL BE CLASS 1, WESTERN RED CEDAR OR DOUGLAS FIR, PER ANSI 05.1—LATEST EDITION.
- 2. METAL TAGS AND NAILS FOR BURN BRAND ARE NOT ALLOWED.

DESIGNED DPG
DR: DOW
RECOM.
APPROVED

CHKD: DPG
SCALE: NONE
CONTRACT:



DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

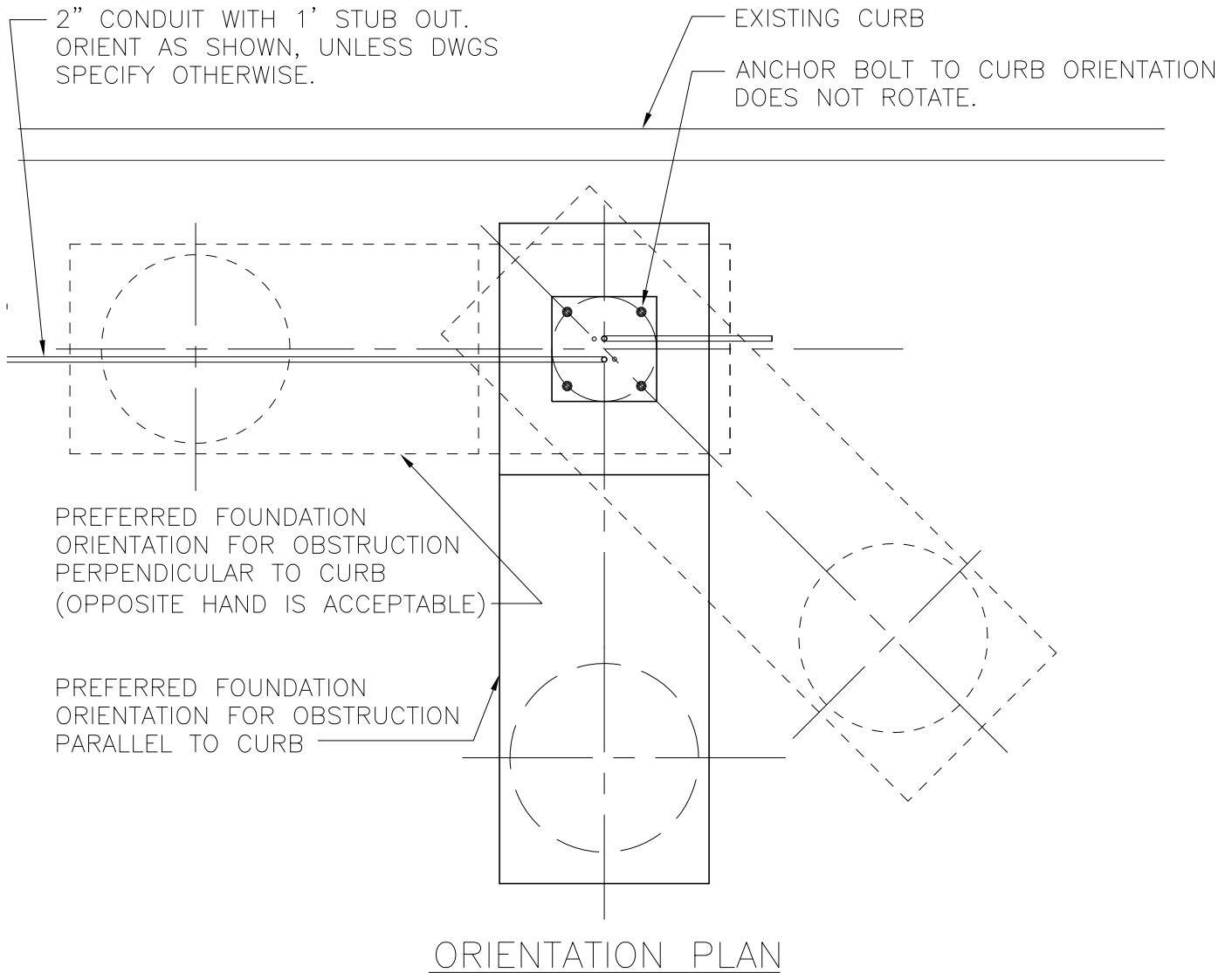
WOOD POLE
FRAMING DETAILS

DATE: MAR 00
FILE
DWG. NO. SA-202A
SHT 1 OF 1

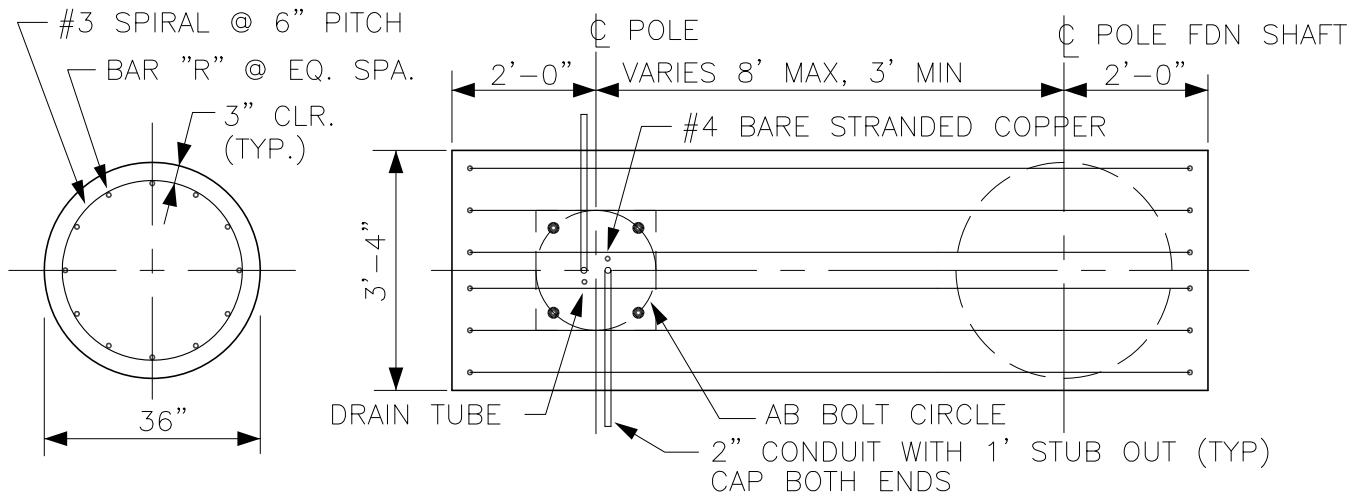
DETAILS FOR SHTS 2,3 & 4

FOUNDATION TYPE	NORMAL WORKING MOMENT (LB-FT)	DIMENSIONS					REBAR QUANTITIES					
		A	P	G	B	D	R*	T	V	W	Y	Z
SA-211B	40,000	2'-4"	9"	6.5"	2.5"	8'-6"	8-#8	4-#7	6-#7	6-#7	#4@6"	4-#7
SA-211D	80,000	2'-8"	10"	7"	3"	10'-6"	12-#8	4-#8	6-#8	6-#8	#5@5"	4-#8
SA-211F	155,000	3'-0"	11.5"	8"	3.5"	13'-0"	12-#8	4-#8	6-#8	6-#8	#5@4"	4-#8

* ADD (1) #8 VERTICAL FOR GROUNDING

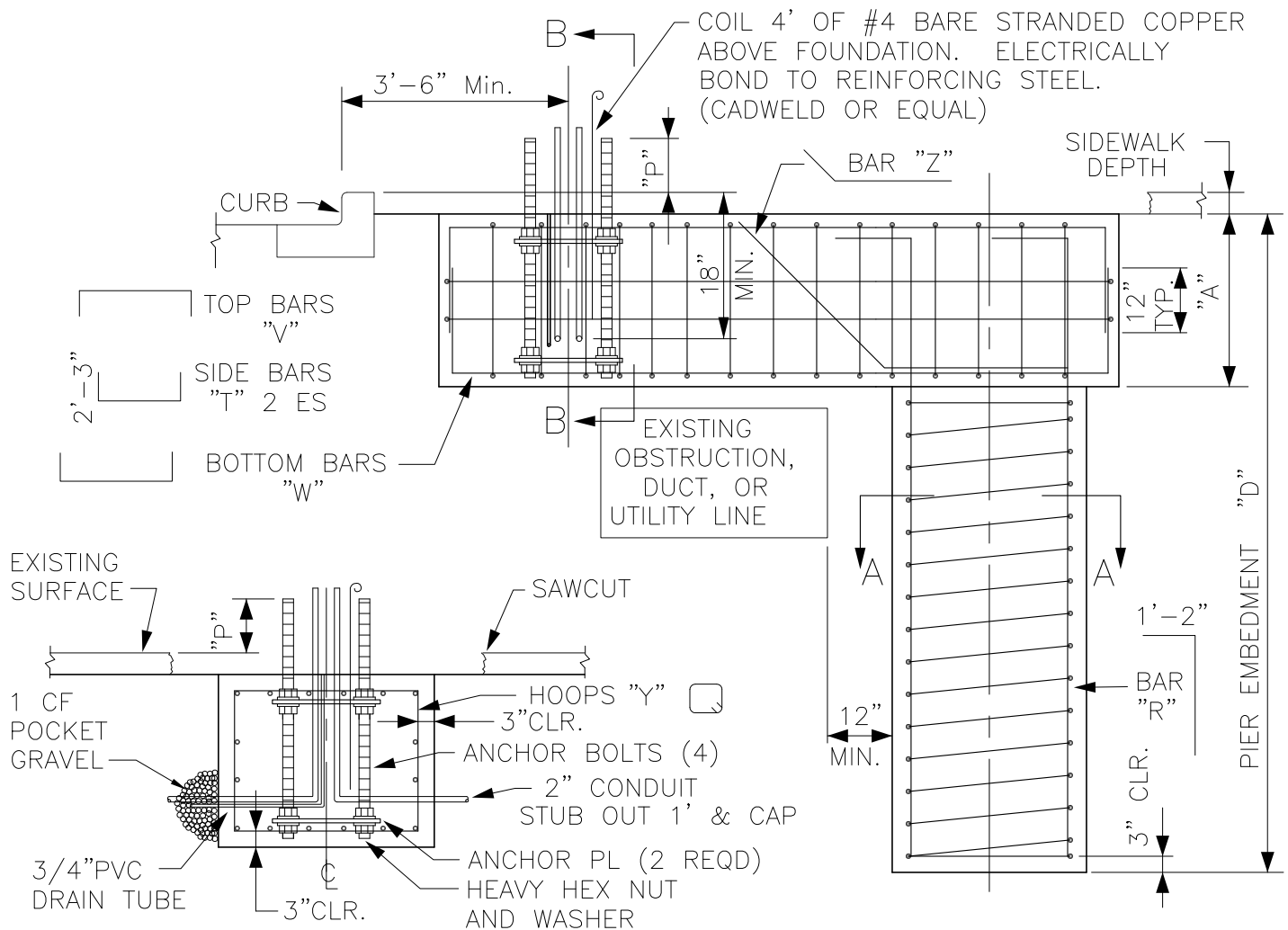


DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS OFFSET FOUNDATION ANCHOR BASE POLE	DATE: OCT 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-211
APPROVED				SHT 1 OF 7



SECTION A-A

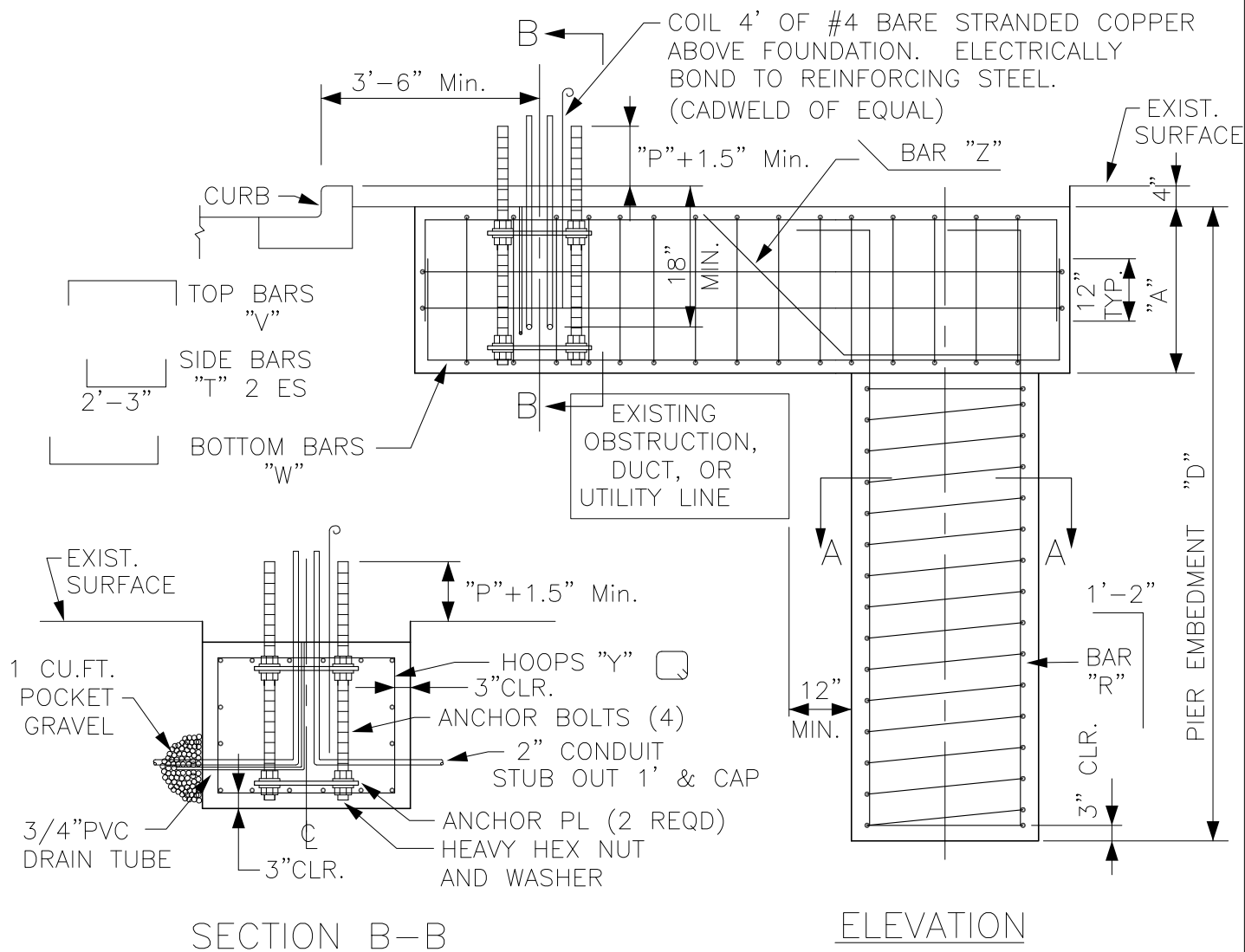
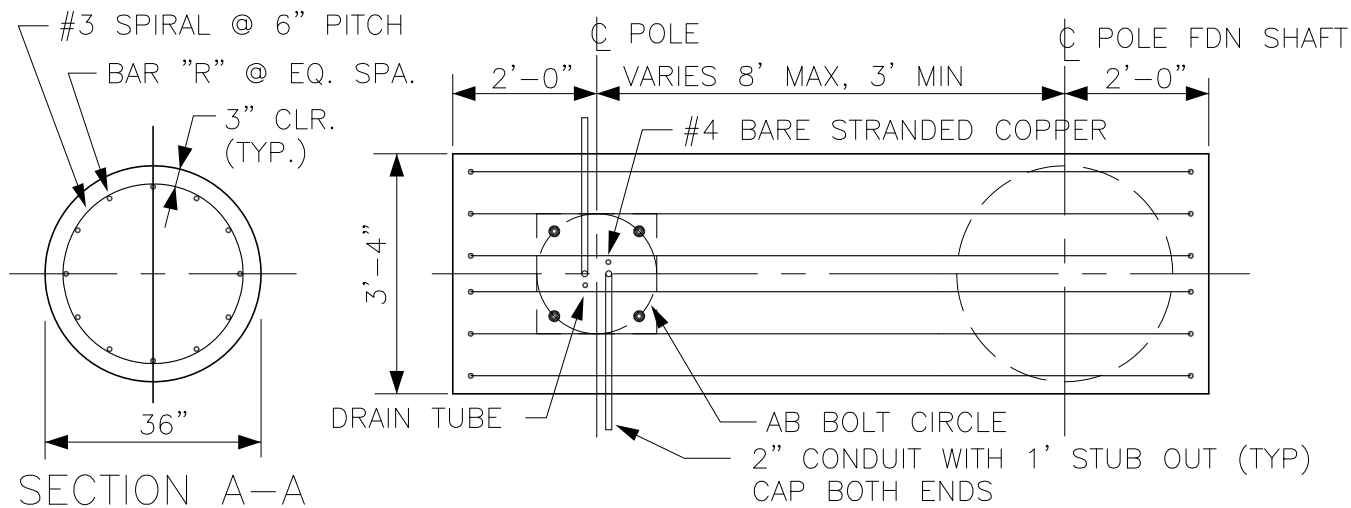
PLAN



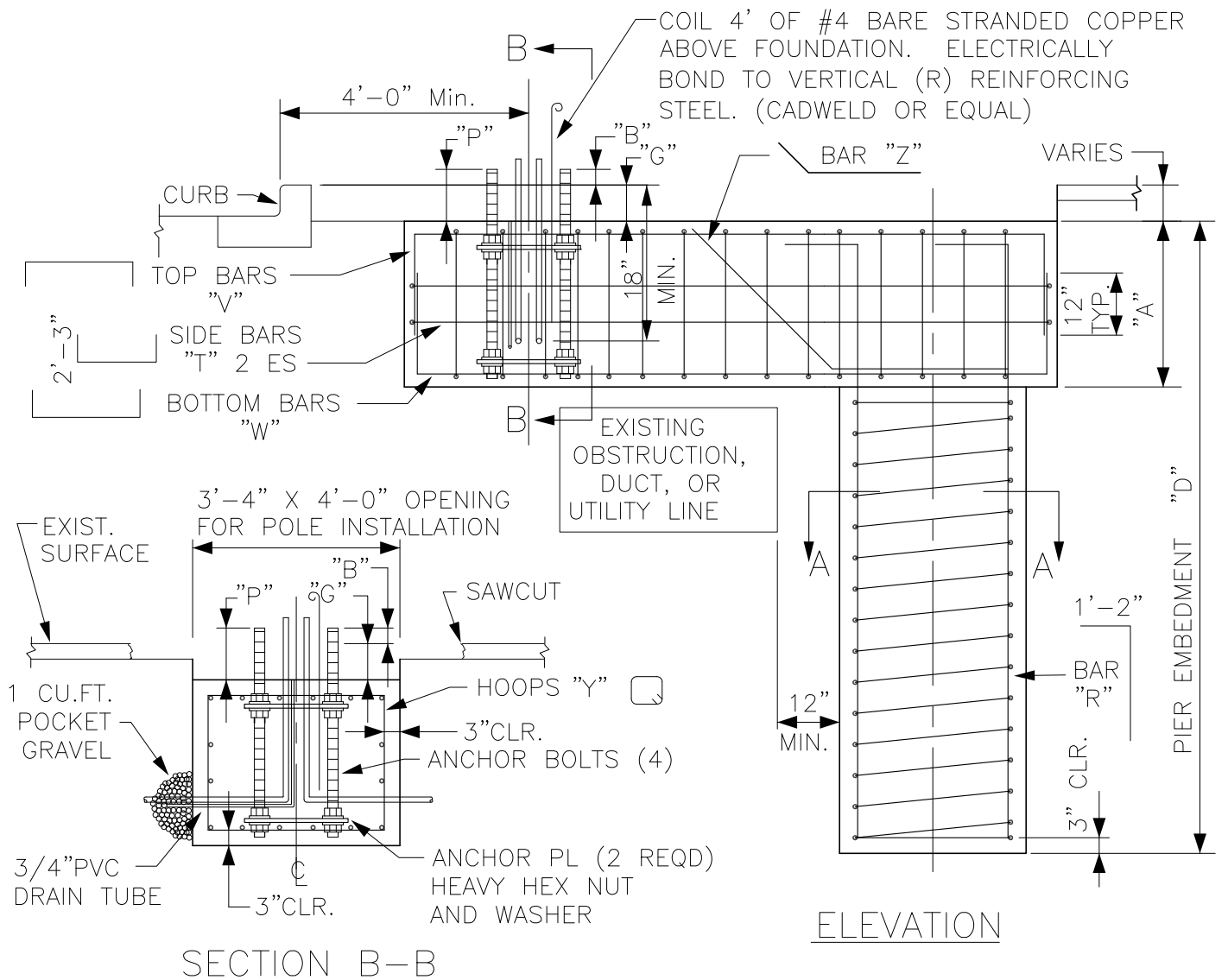
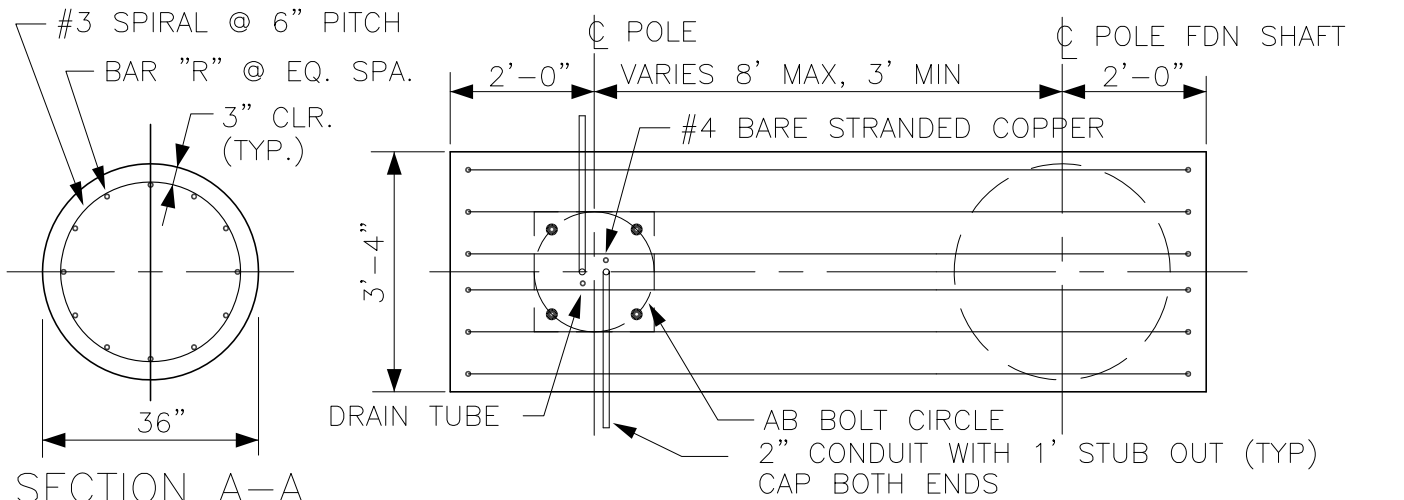
SECTION B-B

ELEVATION

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: DOW	SCALE:			FILE
RECOM.	CONTRACT:		OFFSET FOUNDATION ANCHOR BASE POLE (WITH SIDEWALK)	DWG. NO. SA-211
APPROVED				SHT 2 OF 7



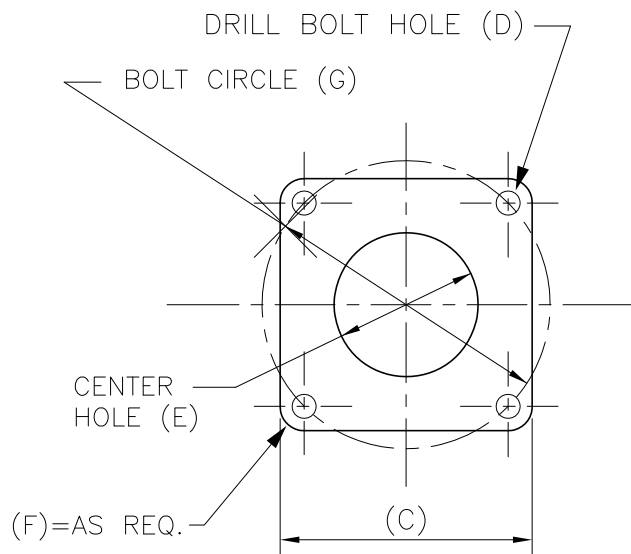
DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:		OFFSET FOUNDATION ANCHOR BASE POLE (WITHOUT SIDEWALK)	DWG. NO. SA-211
APPROVED				SHT 3 OF 7



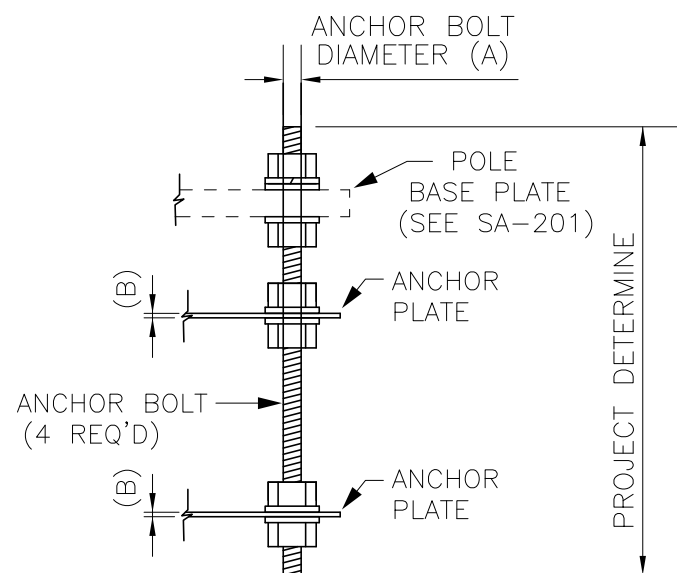
DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:		OFFSET FOUNDATION ANCHOR BASE POLE (CHIEF SEATTLE BASE)	DWG. NO. SA-211
APPROVED				SHT 4 OF 7

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XREFS: | IMAGES:
PLOTTED: Feb 20, 2008-02:15:17pm By suterj

FOUNDATION TYPE	ANCHOR BOLT DIAM. (INCHES) (A)	ANCHOR PLATE DIMENSIONS (INCHES)					
		PLATE THICK. (B)	PLATE WIDTH (C)	BOLT HOLE (D)	CENTER HOLE (E)	CORNER RADIUS (F)	BOLT CIRCLE (G)
SA-211B	1 3/4	3/8	16 X 16	1 7/8	12 1/2	1 5/8	18
SA-211D	2	3/8	18 X 18	2 1/8	14	2	20
SA-211F	2 1/2	1/2	20 X 20	2 5/8	15	2 1/4	22



ANCHOR PLATE
DETAIL



TYP. ANCHOR BOLT
COMPLETE WITH 6 NUTS
6 FLAT WASHERS & 1 LOCK WASHER

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS OFFSET FOUNDATION ANCHOR BASE POLE	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-211
APPROVED				SHT 5 OF 7

GENERAL NOTES

1. CONCRETE AND REINFORCING STEEL

- 1.1 All work shall be done per City of Seattle Board of Public Works Rules: Chapter 40.4 – Street and Sidewalk Pavement Opening and Restoration Rules if in Street Right Of Way.
- 1.2 Concrete shall be City of Seattle Class AX air entrained, 3/4" max aggregate, and with a minimum compressive strength of 4000 PSI at 28 days.
- 1.3 All reinforcing bars shall be deformed billet steel conforming to ASTM A615 Grade 60.
- 1.4 Minimum clear concrete cover shall be 3 inches.
- 1.5 Reinforcing details and fabrication shall be as recommended in ACI 315 "Details & Detailing of Concrete Reinforcement."
- 1.6 No construction joints shall be permitted.

2. ANCHOR PLATES, BOLTS, NUTS AND WASHERS

- 2.1 Anchor bolts including nuts and flat washers shall conform to ASTM F1554–99 Grade 105 class 2a including supplementary requirements S2, S3, and S5. Threads shall conform to the ANSI Standard B1.1 for UNC thread. Anchor bolts shall have 36 inches of thread on exposed end and 12 inches of thread on the embedded end, or shall be fully threaded.
- 2.2 Anchor plates shall conform to ASTM A36.

3. GALVANIZING

- 3.1 Anchor plates, anchor bolts, anchor bolt nuts and washers shall be hot-dip galvanized in conformance to ASTM A153 or ASTM A123.

4. SOIL

- 4.1 Embedment depth is adequate for three times the working moment in cohesive soils of $c=1000\text{PSF}$ and $\phi=0^\circ$ or better and cohesionless soils of $c=0\text{PSF}$ and $\phi=26^\circ$ or better.

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS OFFSET FOUNDATION ANCHOR BASE POLE	DATE: FEB 08
DR: BFB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-211
APPROVED				SHT 6 OF 7

GENERAL NOTES

4.2 Embedment depth is adequate for three times the working moment in cohesive soils of $c=1000\text{PSF}$ and $\phi=0^\circ$ or better and cohesionless soils of $c=0\text{PSF}$ and $\phi=26^\circ$ or better.

5. SUBMITTALS

5.1 Reinforcing steel shop drawings and certificate of compliance.

5.2 Concrete mix proportions, admixtures and slump.

5.3 Anchor plate, anchor bolt, anchor bolt nuts and washers certificates of compliance.

5.4 A test report shall be provided in accordance with ASTM F1554-99 and supplementary requirements.

6. INSPECTION

6.1 Concrete shall not be placed until the Engineer has inspected the excavation, the grounding, the anchor bolts, and the placement of the reinforcing bar cage.

7. ANCHOR BOLT SETTING

7.1 Cover exposed anchor bolt threads and nuts with at least 3 layers of plastic tape before placing concrete.

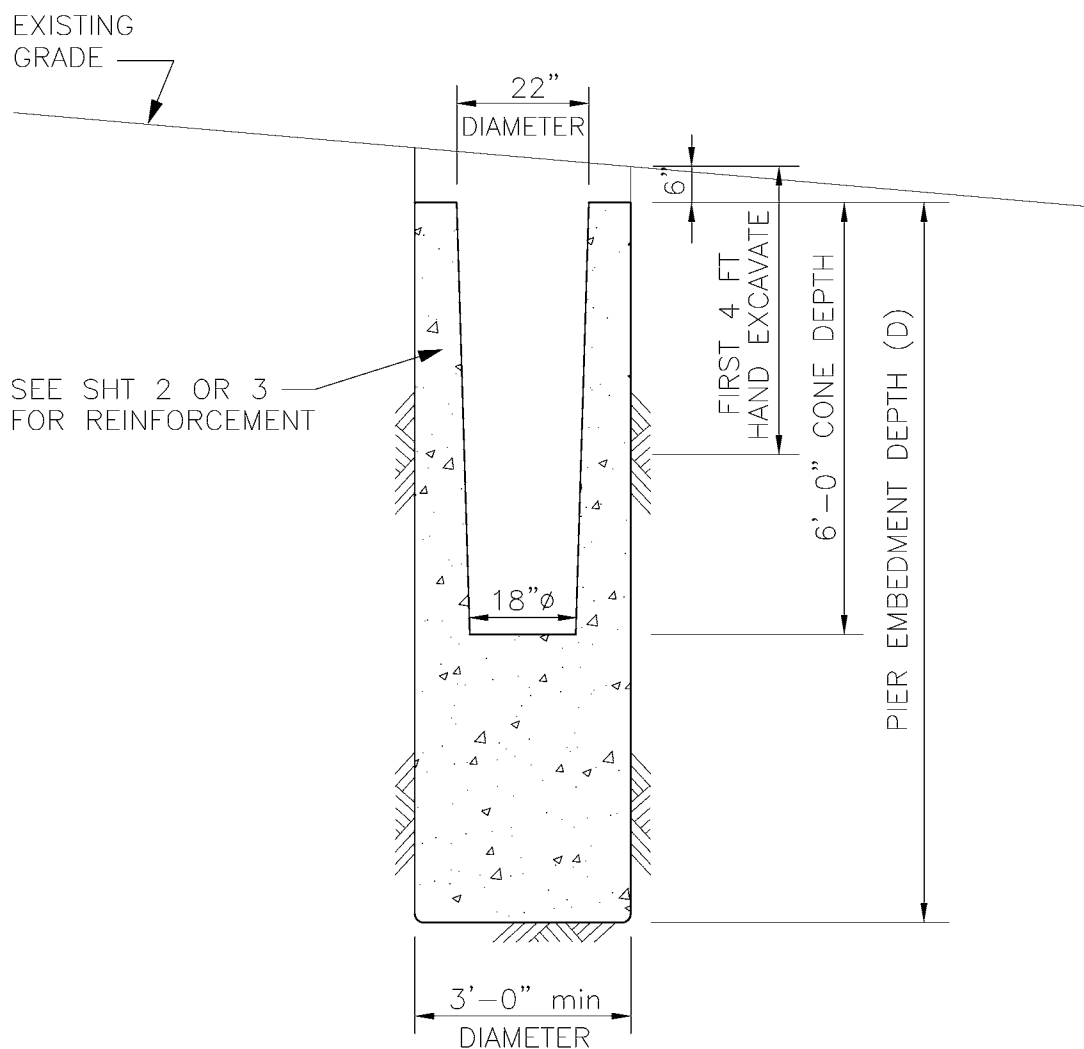
7.2 Anchor bolt template shall be used temporarily at the top of anchor bolts for accurate positioning and aligning.

8. CONDUIT

8.1 Conduit from foundation shall be schedule 80 PVC.
Conduit bends shall have a minimum radius of 12".

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS OFFSET FOUNDATION ANCHOR BASE POLE	DATE: FEB 99
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-211
APPROVED				SHT 7 OF 7

EMBEDDED FOUNDATION SCHEDULE				
FOUNDATION TYPE	NORMAL WORKING MOMENT (LB-FT)	PIER EMBEDMENT DEPTH (D) (FEET)	REBAR REQUIREMENTS	
			VERTICAL	SPIRAL TIES
SA-212-B	40,000	8.5	8-#8	#3 @ 6"
SA-212-D	80,000	10.5	12-#8	#3 @ 6"
SA-212-F	155,000	13	12-#8	#3 @ 6"



INCLINED CONDITION & CONE DETAIL

REBAR NOT SHOWN FOR CLARITY

NOTES

- SEE SHEET 4 FOR GENERAL NOTES.

DESIGNED D GREER	CHKD: A WOLAK
DR: BFB	SCALE: NONE
RECOM.	IBIS NO:
APPROVED J DAVIS	CONTRACT NO:

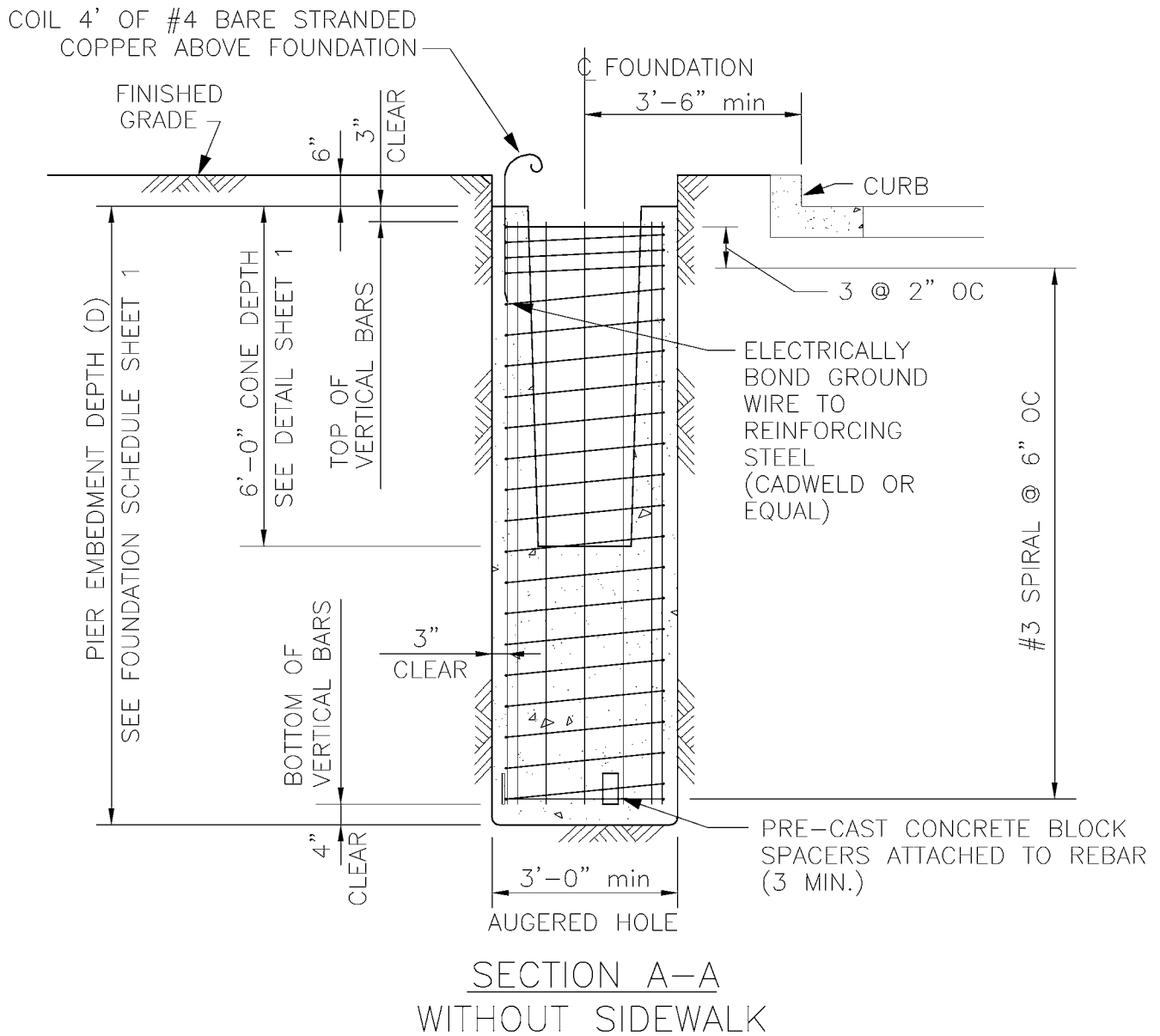
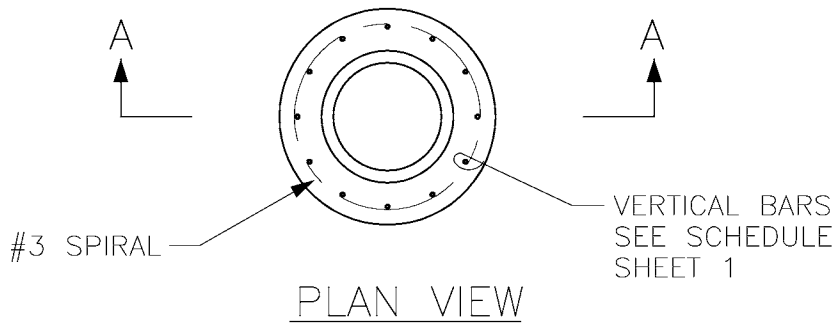


King County

METRO TRANSIT DIVISION
TROLLEY STANDARDS
EMBEDDED STEEL POLE FOUNDATION

STANDARD FOUNDATION

DATE: JULY 2006
FILE
DWG. NO. SA-212
SHT 1 OF 6



NOTES

1. SEE SHEET 4 FOR GENERAL NOTES.

DESIGNED
D GREER

DR:
BFB

RECOM.

APPROVED
J DAVIS

CHKD:
A WOLAK

SCALE:
NONE

IBIS NO:

CONTRACT NO:



King County

METRO TRANSIT DIVISION
TROLLEY STANDARDS
EMBEDDED STEEL POLE FOUNDATION

STANDARD FOUNDATION

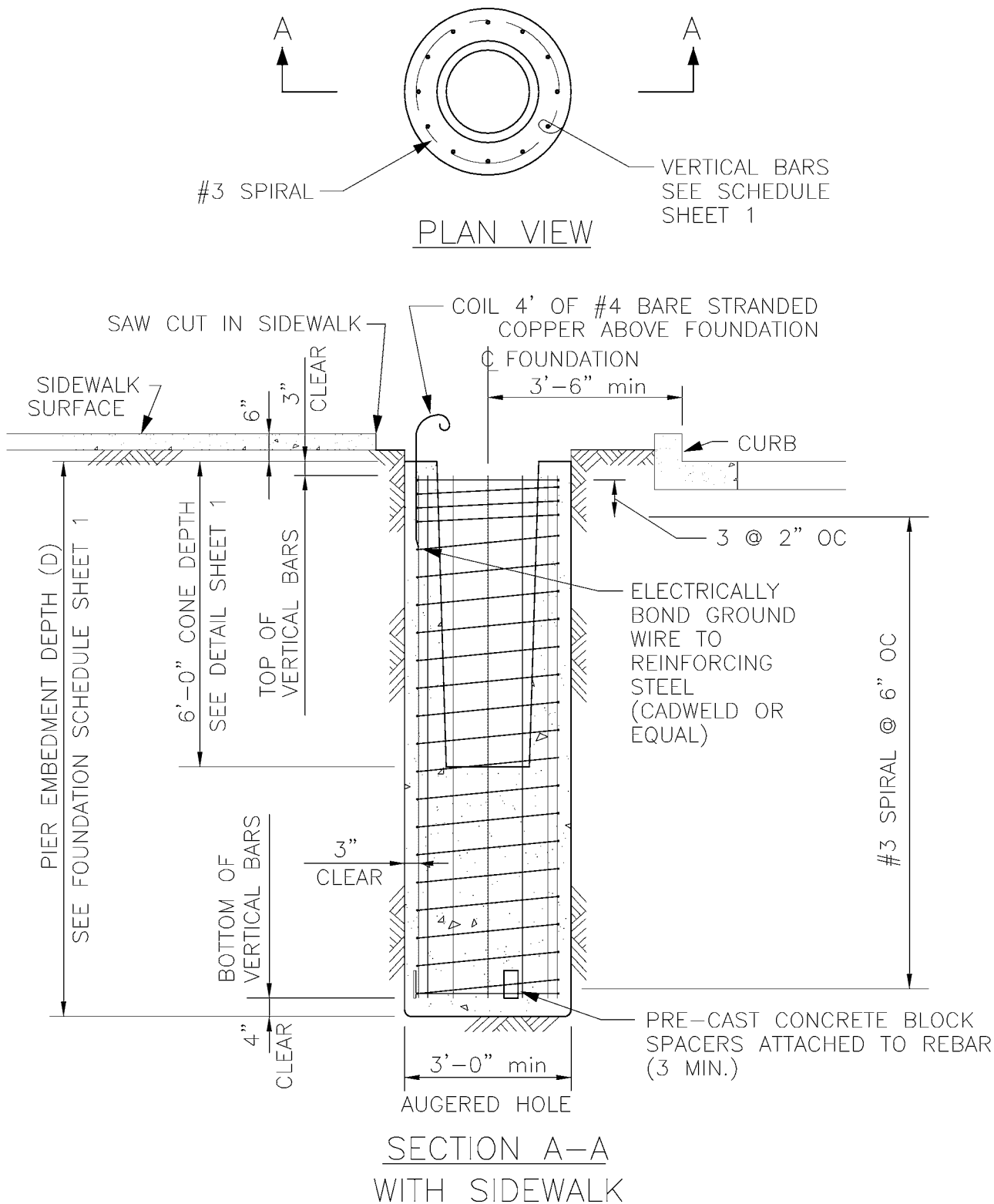
DATE:
JULY 2006

FILE

DWG. NO.

SA-212

SHT 2 OF 6



NOTES

- SEE SHEET 4 FOR GENERAL NOTES.

DESIGNED
D GREER

DR:
BFB

RECOM.

APPROVED
J DAVIS

CHKD:
A WOLAK

SCALE:
NONE

IBIS NO:

CONTRACT NO:



King County

METRO TRANSIT DIVISION
TROLLEY STANDARDS
EMBEDDED STEEL POLE FOUNDATION

STANDARD FOUNDATION

DATE:
JULY 2006

FILE

DWG. NO.

SA-212

SHT 3 OF 6

GENERAL NOTES

1. CONCRETE

- 1.1 All work shall be done per City of Seattle Board of Public Works Rules: Chapter 40.4 – Street and Sidewalk Pavement Opening and Restoration Rules if in Street Right Of Way.
- 1.2 Concrete shall be City of Seattle Class AX air entrained, 3/4" max aggregate, and with a minimum compressive strength of 4000 PSI at 28 days.
- 1.3 All reinforcing bars shall be deformed billet steel conforming to ASTM A615 Grade 60.
- 1.4 Minimum clear concrete cover shall be 3 inches.
- 1.5 Reinforcing details and fabrication shall be as recommended in ACI 315 "Details & Detailing of Concrete Reinforcement."
- 1.6 No construction joints shall be permitted.

2. SOIL

- 2.1 Embedment depth is based upon research report numbers 105-1, 105-2 Resistance of a drilled shaft footing to overturning loads by Texas Transportation Institute, 1968.
- 2.2 Embedment depth is adequate for three times the working moment in cohesive soils of $c=1000\text{PSF}$ and $\phi=0^\circ$ or better and cohesionless soils of $c=0\text{PSF}$ and $\phi=26^\circ$ or better.

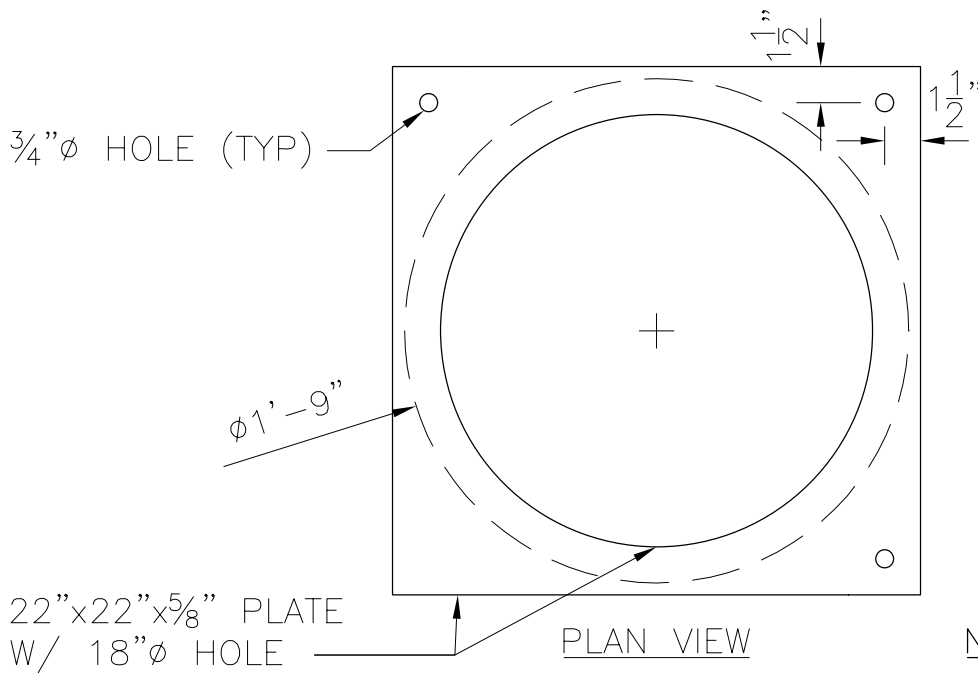
3. SUBMITTALS

- 3.1 Reinforcing steel shop drawings and certificate of compliance.
- 3.2 Concrete mix proportions, admixtures and slump.

4. INSPECTION

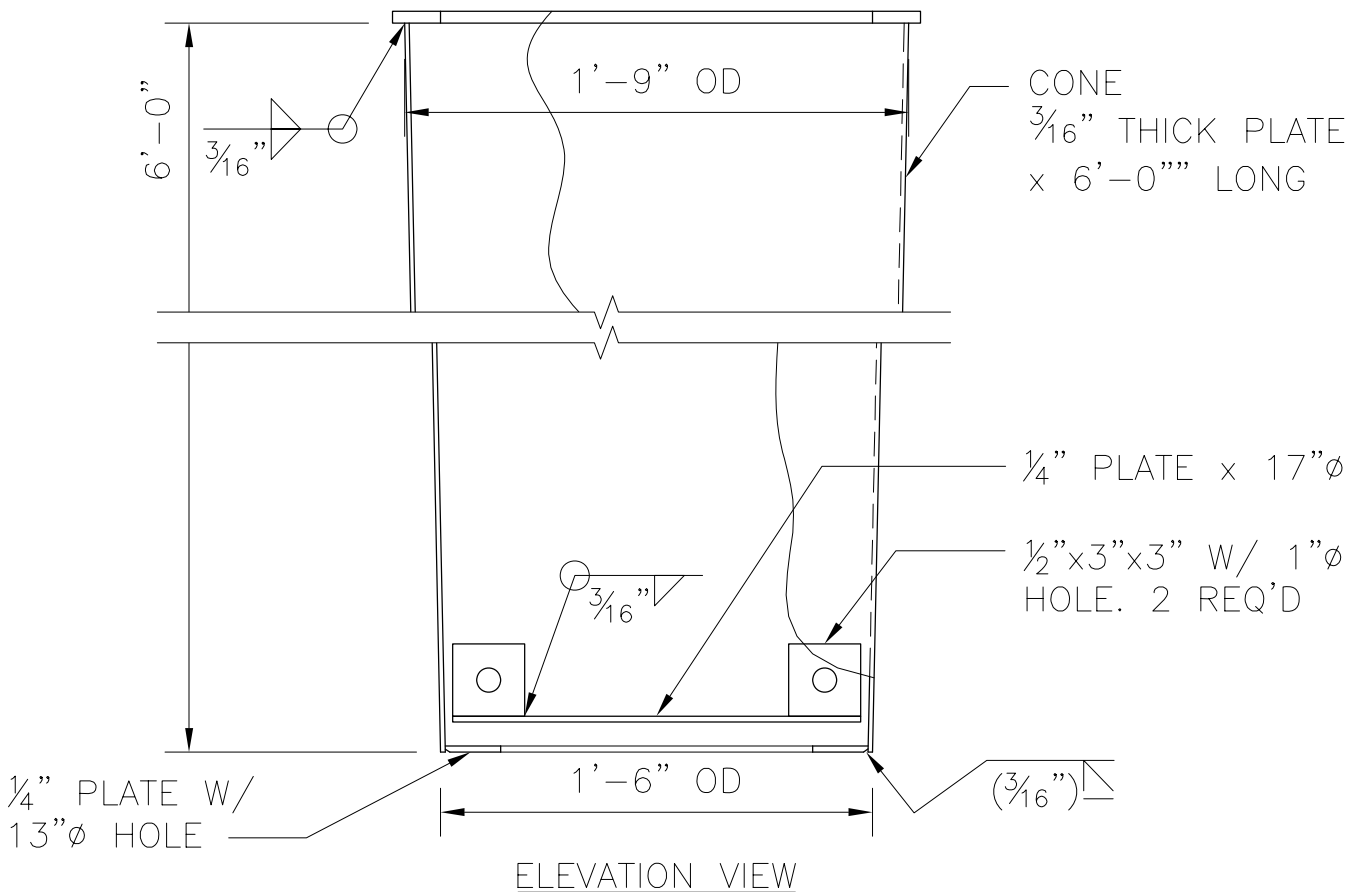
- 4.1 Concrete shall not be placed until the Engineer has inspected the excavation, the grounding, the cone, and the placement of the reinforcing bar cage.

DESIGNED D GREER	CHKD: A WOLAK	 King County	METRO TRANSIT DIVISION TROLLEY STANDARDS EMBEDDED STEEL POLE FOUNDATION STANDARD FOUNDATION	DATE: JULY 2006
DR: BFB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-212
APPROVED J DAVIS	CONTRACT NO:			SHT 4 OF 6



NOTE:

ALL MATERIAL SHALL
BE ASTM A36.



DESIGNED D GREER	CHKD: J DAVIS
DR: B FARISS-B	SCALE: 1.5" = 1'
RECOM.	IBIS NO:
APPROVED	CONTRACT NO:



King County

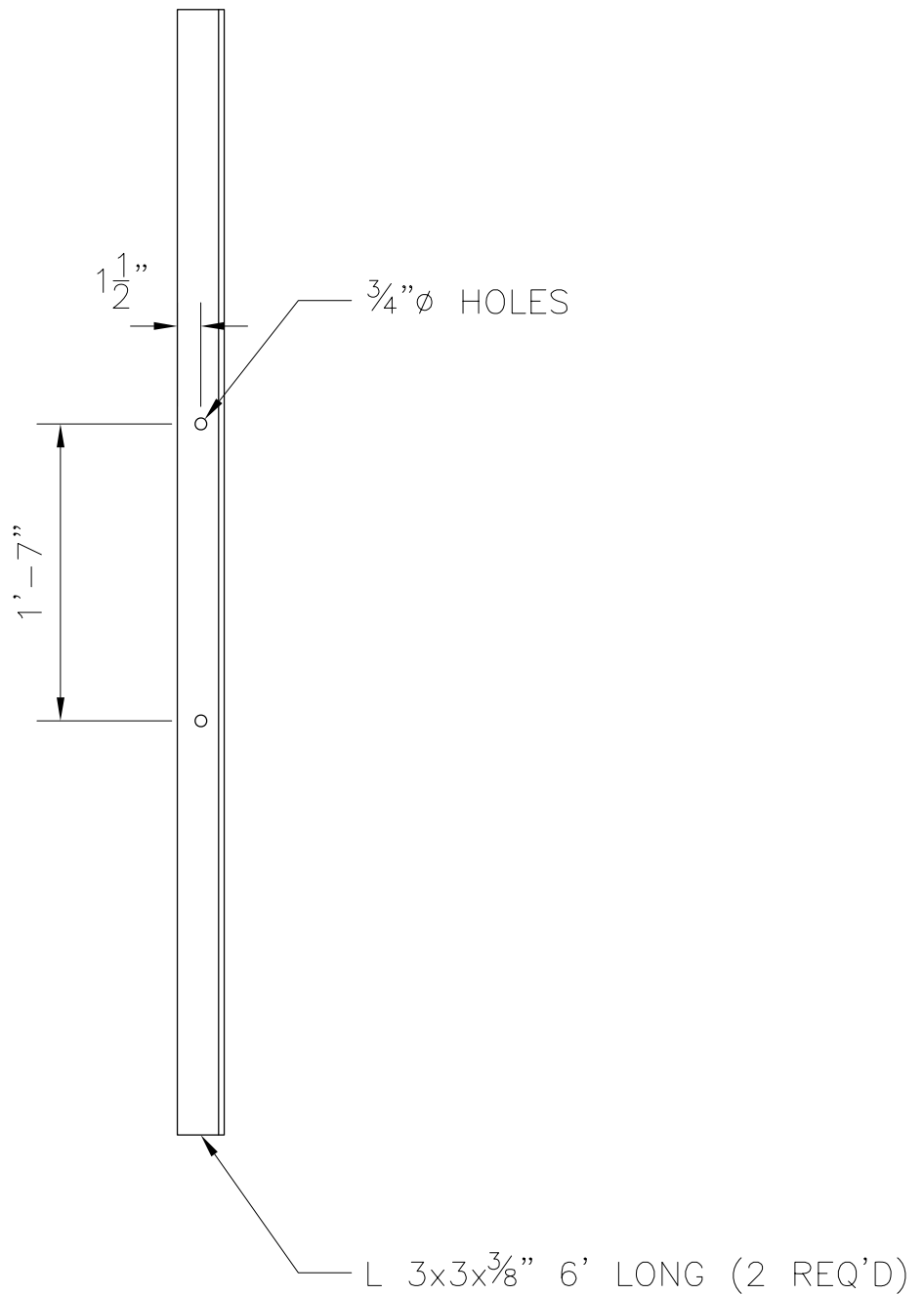
METRO TRANSIT DIVISION
TROLLEY STANDARDS
EMBEDDED STEEL POLE FOUNDATION

INTERIOR CONE FORM
FOR SA-212

DATE: JANUARY 07
FILE
DWG. NO. SA-212
SHT 5 OF 6

NOTE:

MATERIAL SHALL BE
ASTM A36.



DESIGNED D GREER	CHKD: J DAVIS
DR: B FARISS-B	SCALE: 1" = 1'
RECOM.	IBIS NO:
APPROVED	CONTRACT NO:

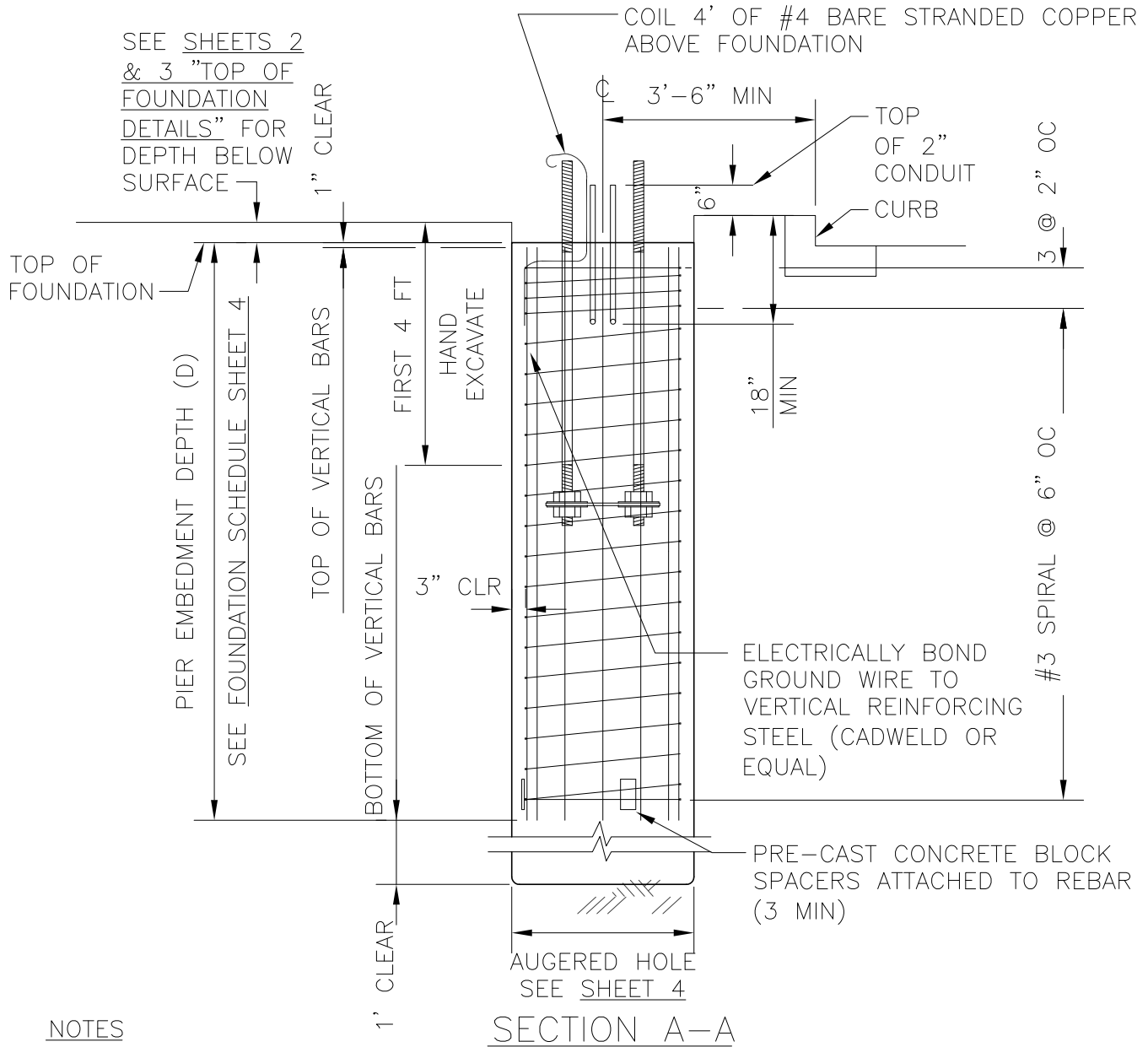
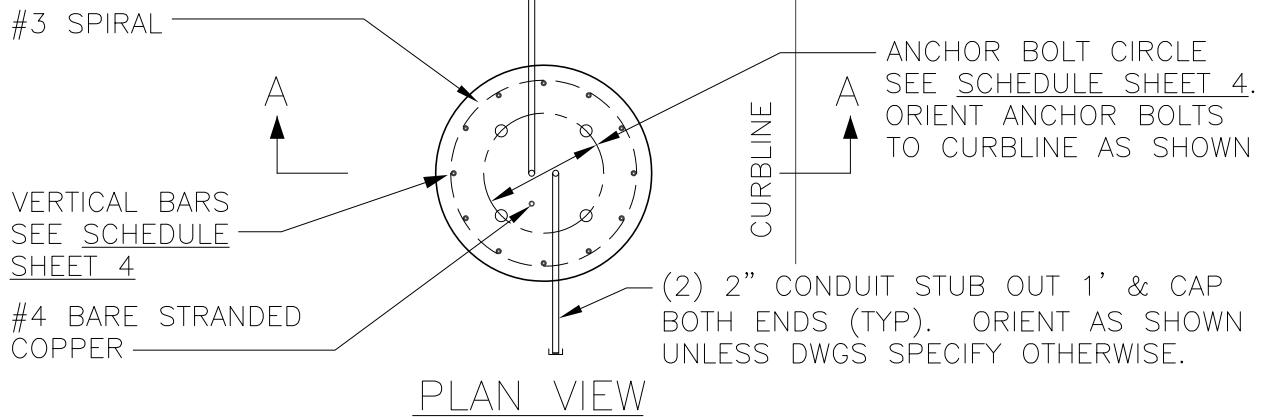


King County

METRO TRANSIT DIVISION
TROLLEY STANDARDS
EMBEDDED STEEL POLE FOUNDATION

INTERIOR CONE FORM
FOR SA-212

DATE: JANUARY 07
FILE
DWG. NO. SA-212
SHT 6 OF 6



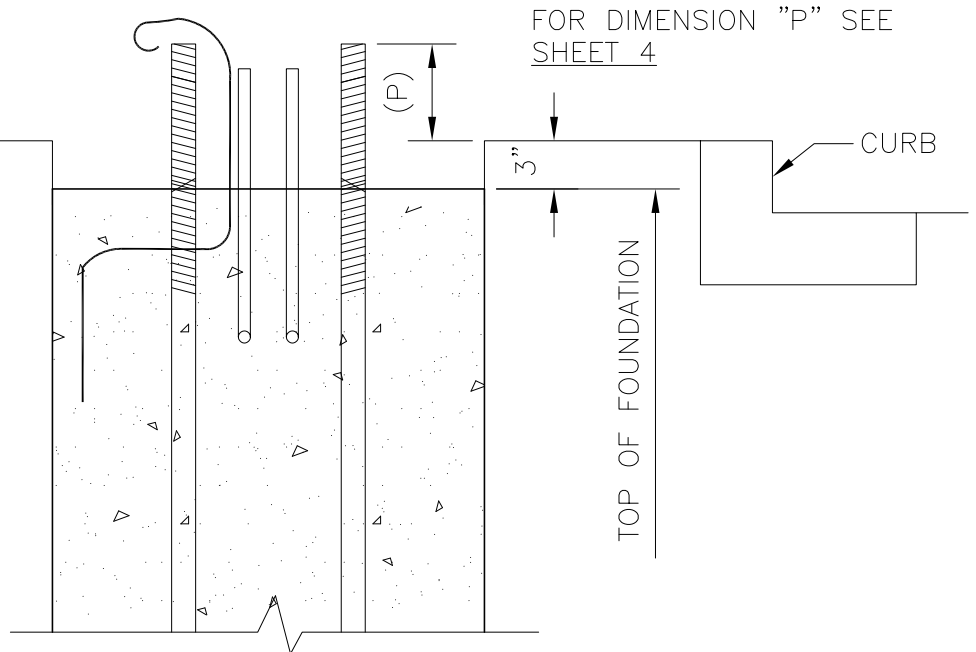
NOTES

- SEE SHEETS 6 & 7 FOR GENERAL NOTES.

DESIGNED: DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS MERCER WEST CORRIDOR PROJECT STANDARD FOUNDATION (ANCHOR BASE STEEL POLE)	DATE: JULY 2012
DRAWN: TMB	SCALE: NONE			FILE
RECOMMENDED:	CONTRACT:			DWG. NO. SA-213
APPROVED:				SHT 1 OF 7

FINISH GRADE

ALL FOUNDATIONS
SHALL BE THIS TYPE
UNLESS SPECIFIED
OTHERWISE ON
DRAWINGS.
SEE SHEET 4 FOR
INCLINED DETAILS



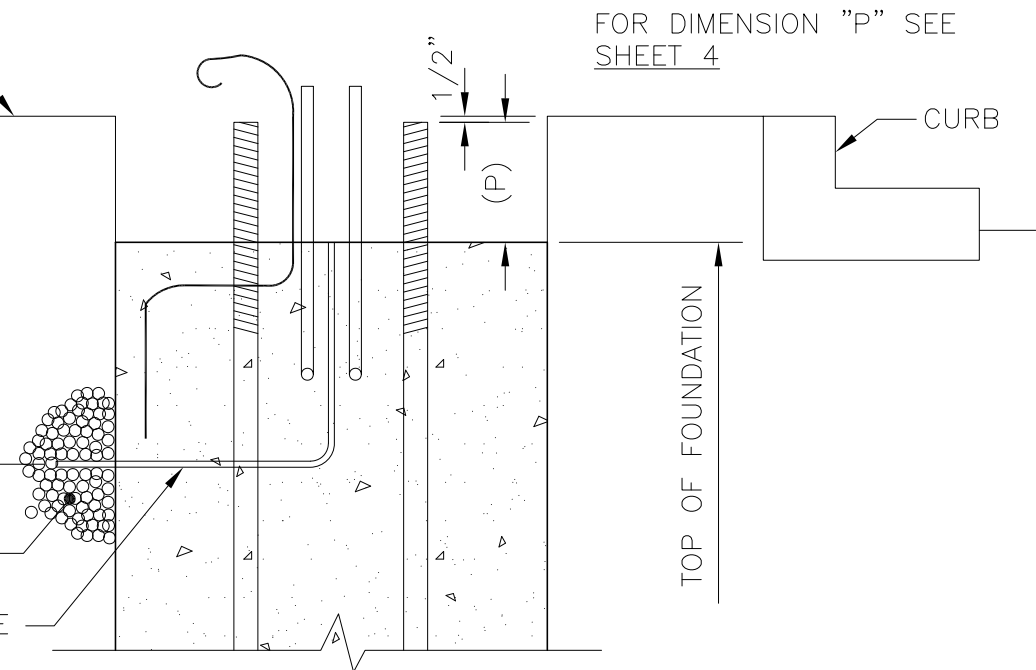
STANDARD CONDITION
TOP OF FOUNDATION DETAILS

FINISH GRADE

1/2 CUBIC FOOT
GRAVEL POCKET

3/4" PVC DRAIN TUBE

24"



BURIED CONDITION
TOP OF FOUNDATION DETAILS
SEE SHEET 4 FOR INCLINED DETAILS

DESIGNED:
DPG

CHKD:
DPG

DRAWN:
TMB

SCALE:
NONE

RECOMMENDED:

CONTRACT:

APPROVED:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS
MERCER WEST CORRIDOR PROJECT

STANDARD FOUNDATION
(ANCHOR BASE STEEL POLE)

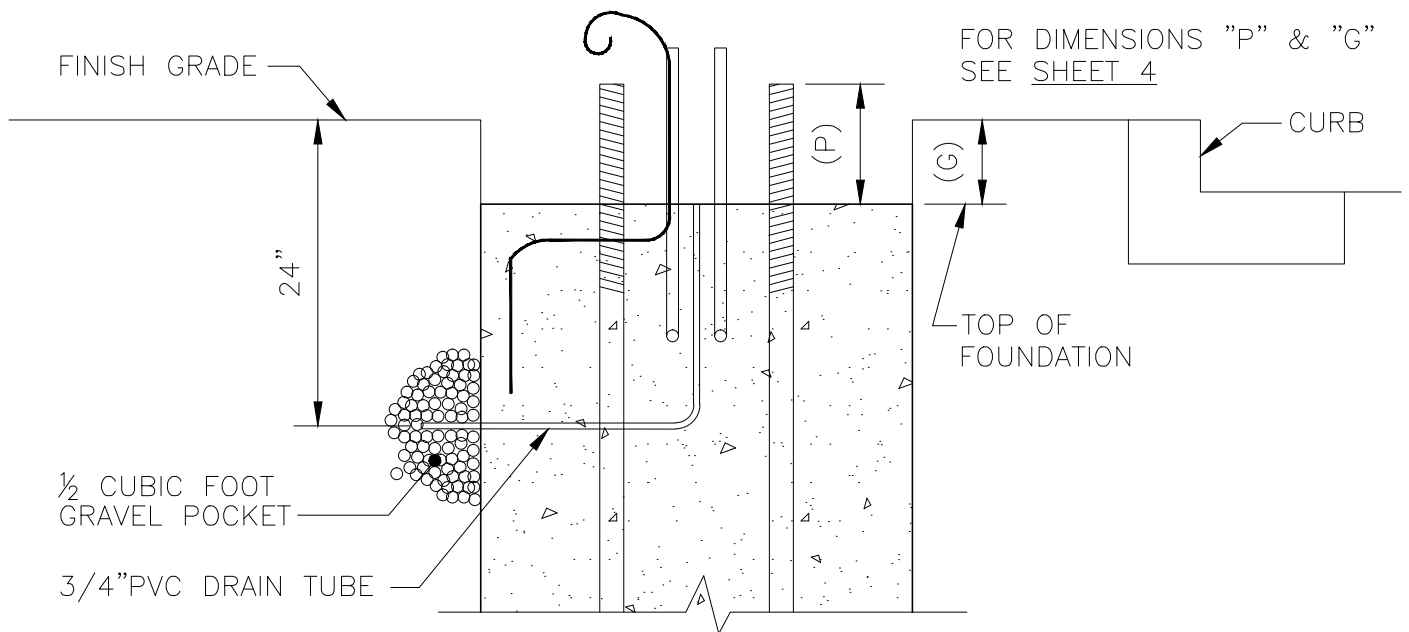
DATE:
JULY 2012

FILE

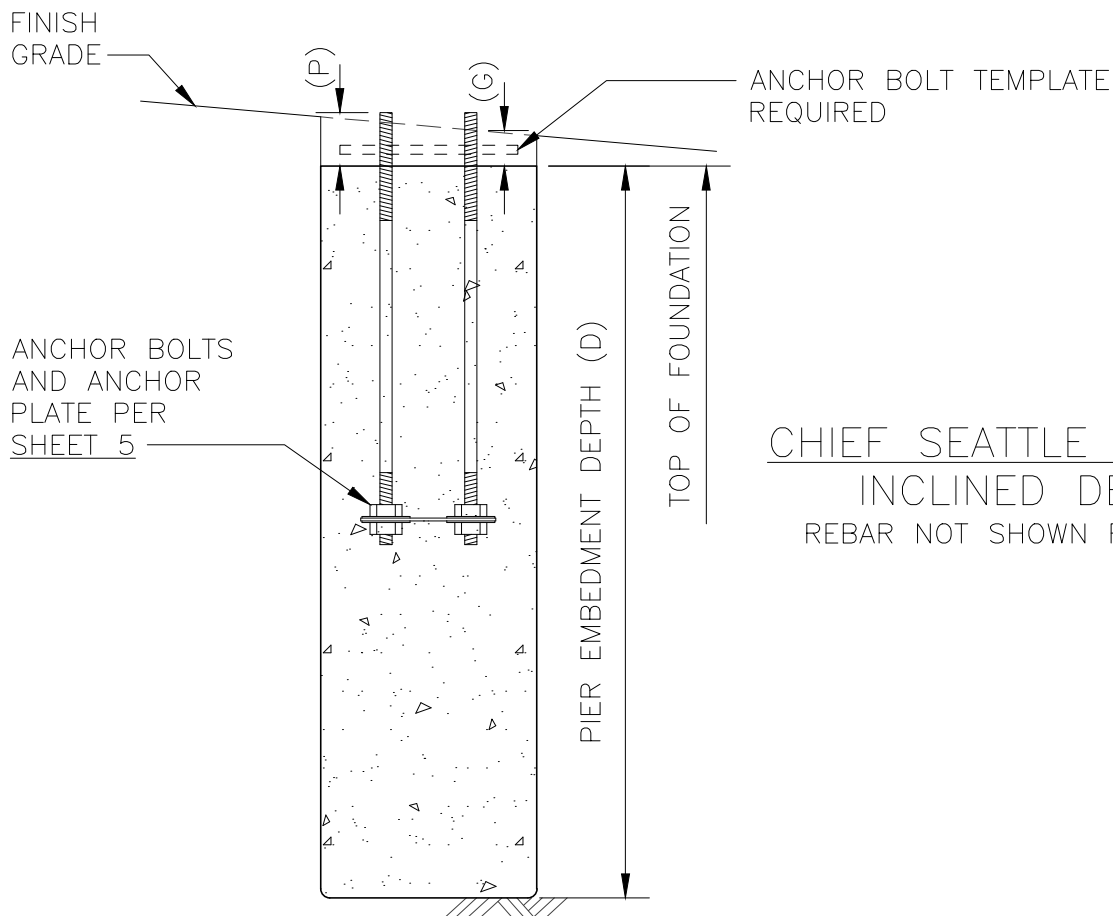
DWG. NO.

SA-213

SHT 2 OF 7



CHIEF SEATTLE CONDITION
TOP OF FOUNDATION DETAILS
USE ONLY WHERE NOTED ON DRAWINGS



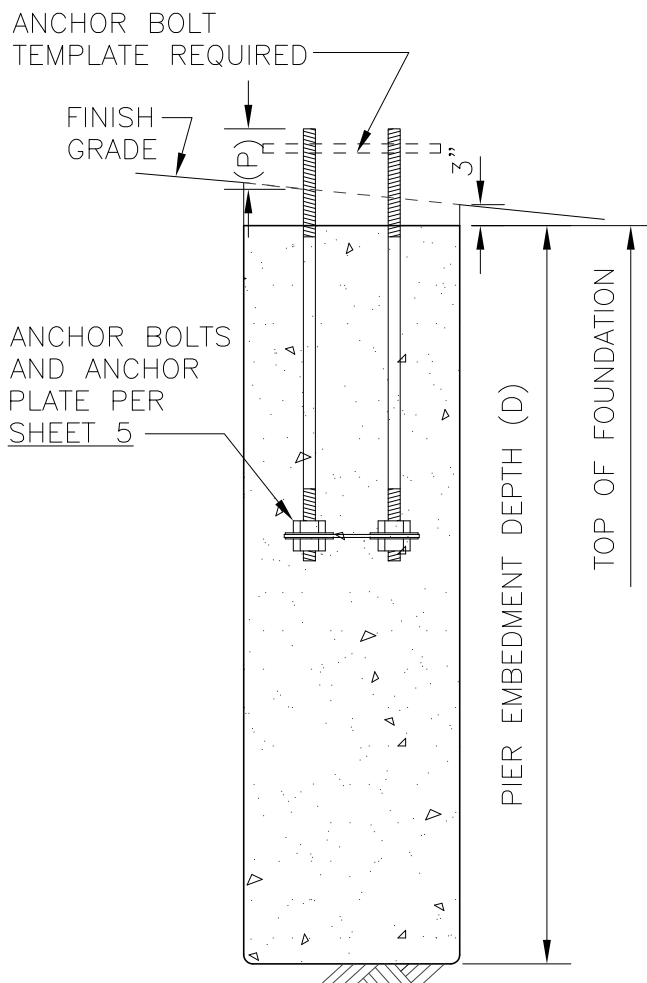
CHIEF SEATTLE CONDITION
INCLINED DETAILS
 REBAR NOT SHOWN FOR CLARITY

DESIGNED: DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STANDARD FOUNDATION (ANCHOR BASE STEEL POLE)	DATE: JULY 2008
DRAWN: TMB	SCALE: NONE			FILE
RECOMMENDED: DOW	CONTRACT:			DWG. NO. SA-213
APPROVED:				SHT 3 OF 7

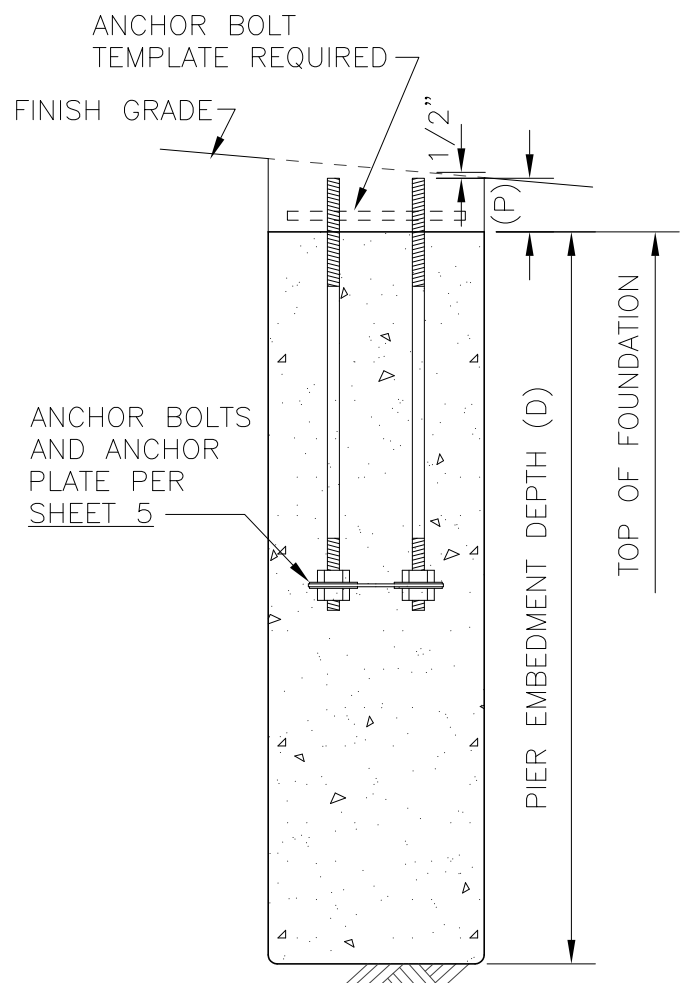
ANCHOR BASE FOUNDATION SCHEDULE

FOUNDATION TYPE	POLE My STANDARD/ MAXIMUM (KIP-FT)	PIER EMBEDMENT DEPTH (D)		PIER DIAMETER (FEET)	REBAR REQUIREMENTS		BOLT CIRCLE ANCHOR	BOLT PROJ ANCHOR	ONLY CHIEF SEATTLE
		4 BLOWS PER FT	2 BLOWS PER FT		VERTICAL*	CONTINUOUS TIES		"P"	"G"
SA-213-A	110/180	9	14	3'-0"	8-#8	#3	15"	8.5"	6"
SA-213-B	110/180	9	14	3'-0"	8-#8	#3	18"	9"	6.5"
SA-213-D	180/270	10.5	16	3'-0"	12-#8	#3	20"	10"	7"
SA-213-F	330/400	13	19	3'-0"	12-#9	#3	22"	11.5"	8"
SA-213-H	600/600	15.5	21	3'-6"	14-#9	#3	24"	12"	8½"

*ADD (1) #8 VERTICAL FOR GROUNDING



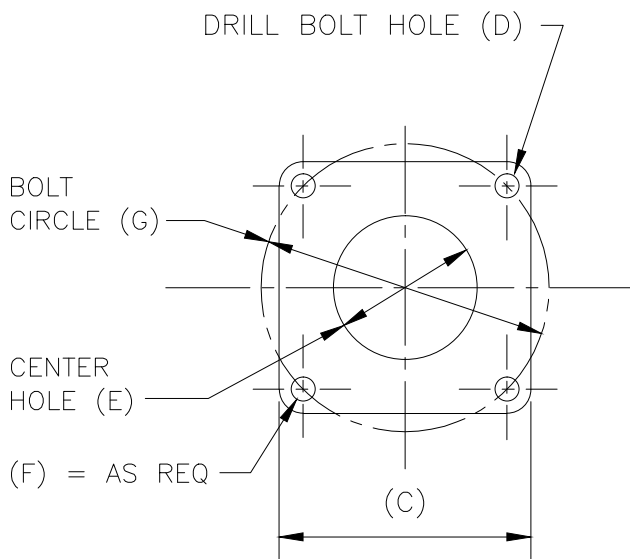
STANDARD CONDITION
INCLINED DETAILS
REBAR NOT SHOWN FOR CLARITY



BURIED CONDITION
INCLINED DETAILS
REBAR NOT SHOWN FOR CLARITY

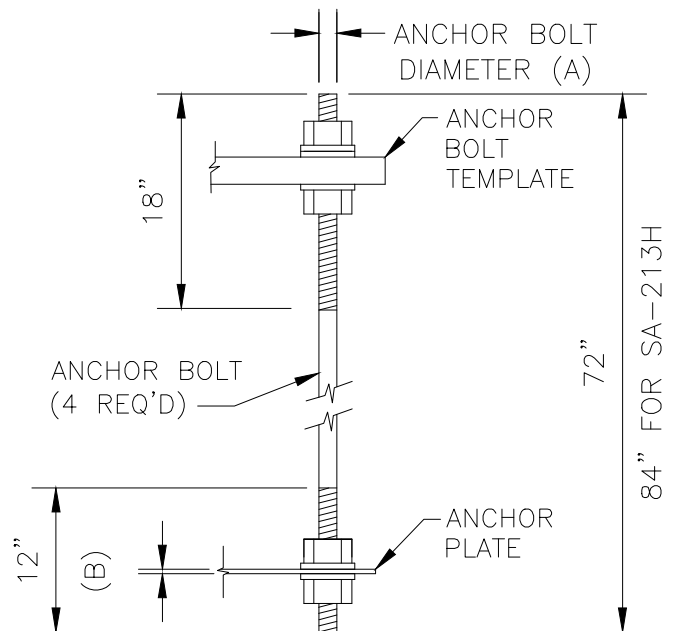
DESIGNED: DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS MERCER WEST CORRIDOR PROJECT STANDARD FOUNDATION (ANCHOR BASE STEEL POLE)	DATE: JULY 2012
DRAWN: BFB/LSA	SCALE: NONE			FILE
RECOMMENDED:	CONTRACT:			DWG. NO. SA-213
APPROVED:				SHT 4 OF 7

FOUNDATION TYPE	ANCHOR BOLT DIAMETER (INCHES) (A)	ANCHOR PLATE DIMENSIONS (INCHES)					
		PLATE THICKNESS (B)	PLATE WIDTH (C)	BOLT HOLE (D)	CENTER HOLE (E)	CORNER RADIUS (F)	BOLT CIRCLE (G)
SA-213-A	1 1/2	3/8	16 X 16	1 5/8	10 1/2	1 1/2	15
SA-213-B	1 3/4	3/8	16 X 16	1 7/8	12 1/2	1 5/8	18
SA-213-D	2	3/8	18 X 18	2 1/8	14	2	20
SA-213-F	2 1/2	3/8	20 X 20	2 5/8	15	2 1/4	22
SA-213-H	2 3/4	1/2	22 X 22	2 7/8	16.5	2 1/2	24



ANCHOR PLATE
DETAIL

SEE GENERAL NOTES SHEETS 6 & 7



TYPICAL ANCHOR BOLT

COMPLETE WITH 4 NUTS 4 FLAT
WASHERS & 1 LOCK WASHER.

SEE GENERAL NOTES/SHEETS 6 & 7

DESIGNED:
DPG

CHKD:
DPG

DRAWN:
TMB/LSA

SCALE:
NTS

RECOMMENDED:

CONTRACT:

APPROVED:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STANDARD FOUNDATION
(ANCHOR BASE STEEL POLE)

DATE:
APR 2012

FILE

DWG. NO.

SA-213

SHT 5 OF 7

GENERAL NOTES

1. CONCRETE AND REINFORCING STEEL

- 1.1 All work shall be done per Seattle Sidewalk and Street Paving and Restoration Rules and Regulations if in Street Right Of Way.
- 1.2 Concrete shall be City of Seattle Class AX air entrained, 3/4" max aggregate, and with a minimum compressive strength of 4000 PSI at 28 days.
- 1.3 All reinforcing bars shall be deformed billet steel conforming to ASTM A615 Grade 60.
- 1.4 Minimum clear concrete cover shall be 3" from sides and bottom and 1" from the top
- 1.5 Reinforcing details and fabrication shall be as recommended in ACI 315 "Details & Detailing of Concrete Reinforcement."
- 1.6 No construction joints shall be permitted.

2. ANCHOR PLATES, BOLTS, NUTS AND WASHERS

- 2.1 Anchor bolts including nuts and flat washers shall conform to ASTM F1554-99 Grade 105 Class 2A including supplementary requirements S2, S3 and S5. Threads shall conform to the ANSI Standard B1.1 for UNC thread. Anchor bolts shall have 18 inches of thread on exposed end and 12 inches of thread on the embedded end.
- 2.2 Anchor plates shall conform to ASTM A36.

3. GALVANIZING

- 3.1 Anchor plates, anchor bolts, anchor bolt nuts and washers shall be hot-dip galvanized in conformance to ASTM A153 or ASTM A123.

4. SOIL

- 4.1 Embedment depth is adequate for three times the working moment in cohesive soils of $c=1000\text{PSF}$ and $\phi=0^\circ$ or better and cohesionless soils of $c=0\text{PSF}$ and $\phi=26^\circ$ or better.

5. SUBMITTALS

- 5.1 Reinforcing steel shop drawings and certificate of compliance.
- 5.2 Concrete mix proportions, admixtures and slump.
- 5.3 Anchor plate, anchor bolt, anchor bolt nuts and washers certificates of compliance.
- 5.4 A test report shall be provided in accordance with ASTM F1554-99 and supplementary requirements.

(continued, sheet 7 of 7)

DESIGNED: DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS MERCER WEST CORRIDOR PROJECT STANDARD FOUNDATION (ANCHOR BASE STEEL POLE)	DATE: JULY 2012
DRAWN: BFB/LSA	SCALE: NONE			FILE
RECOMMENDED:	CONTRACT:			DWG. NO. SA-213
APPROVED:				SHT 6 OF 7

GENERAL NOTES

(continued from sheet 6 of 7)

6. INSPECTION

6.1 Concrete shall not be placed until the King County Project Representative has inspected the excavation, the grounding, the anchor bolts, and the placement of the reinforcing bar cage.

7. ANCHOR BOLT SETTING

7.1 Cover exposed anchor bolt threads and nuts with at least 3 layers of plastic tape before placing concrete.

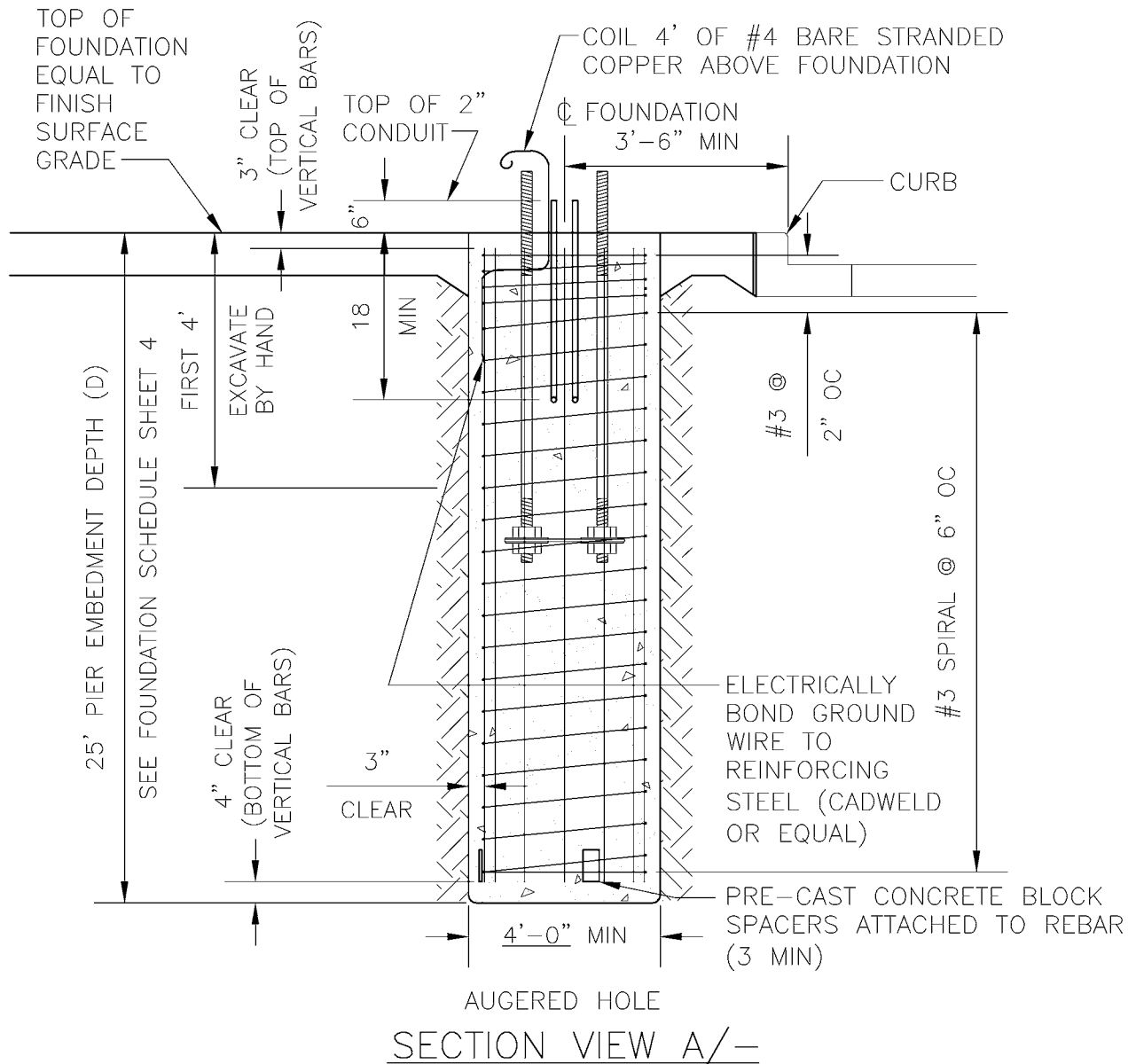
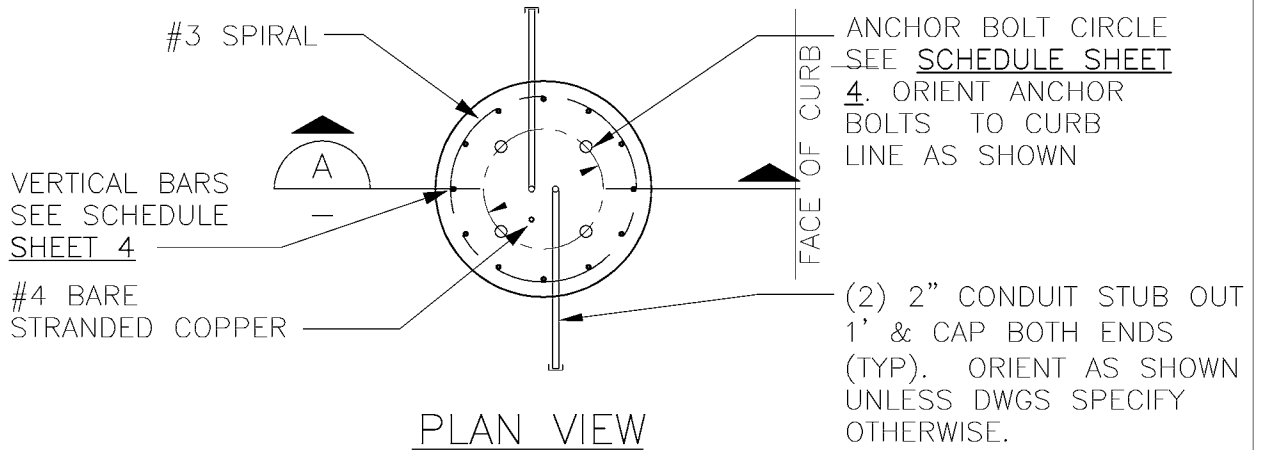
7.2 Anchor bolt template shall be used temporarily at the top of anchor bolts for accurate positioning and aligning.

7.3 Anchor bolts shall not exceed $\frac{1}{8}$ " from vertical over the entire length of bolt upon completion of foundation.

8. CONDUIT

8.1 Conduit from foundation shall be schedule 80 PVC. Conduit bends shall have a minimum radius of 12".

DESIGNED: DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STANDARD FOUNDATION (ANCHOR BASE STEEL POLE)	DATE: APR 2012
DRAWN: DOW/LSA	SCALE: NONE			FILE
RECOMMENDED:	CONTRACT:			DWG. NO. SA-213
APPROVED:				SHT 7 OF 7



NOTES

1. SEE SHEETS 6 & 7 FOR GENERAL NOTES.

DESIGNED
DPG

DR:
BFB

RECOM.

APPROVED

CHKD:
AJW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS
SPECIAL FOUNDATION
(ANCHOR BASE STEEL POLE)

DATE:
JANUARY 04

FILE

DWG. NO.
SA-213(S)

SHT 1 OF 7

TOP OF FOUNDATION AT
FINISH GRADE SURFACE

8"

1'

1 1/2"

CURB

1.5

TYPICAL
TOP OF POLE FOUNDATION
DETAIL
SCALE: 3/4" = 1'-0"

V:\Library & Standards\Standards\Trolley\Details\SA-213S.1-7.dwg, SA-213-2, 1/5/2007 12:23:22 PM

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SPECIAL FOUNDATION FOR ANCHOR BASE STEEL POLE	DATE: JANUARY 04
DR: BFB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-213(S)
APPROVED				SHT 2 OF 7

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ANCHOR BASE FOUNDATION SCHEDULE						
FOUNDATION TYPE	GROUND LINE M ₀ (LB-FT)	PIER EMBEDMENT DEPTH (D) (FEET)	REBAR REQUIREMENTS		ANCHOR BOLT CIRCLE	ANCHOR BOLT PROJ.
			VERTICAL	CONTINUOUS TIES		"P"
SA-213-(S)	480,000	25	16-#9	#3	22"	11.5"

DESIGNED
DPG

DR:
AJW

RECOM.

APPROVED

CHKD:

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

ANCHOR BASE FOUNDATION
SCHEDULE

DATE:
JANUARY 04

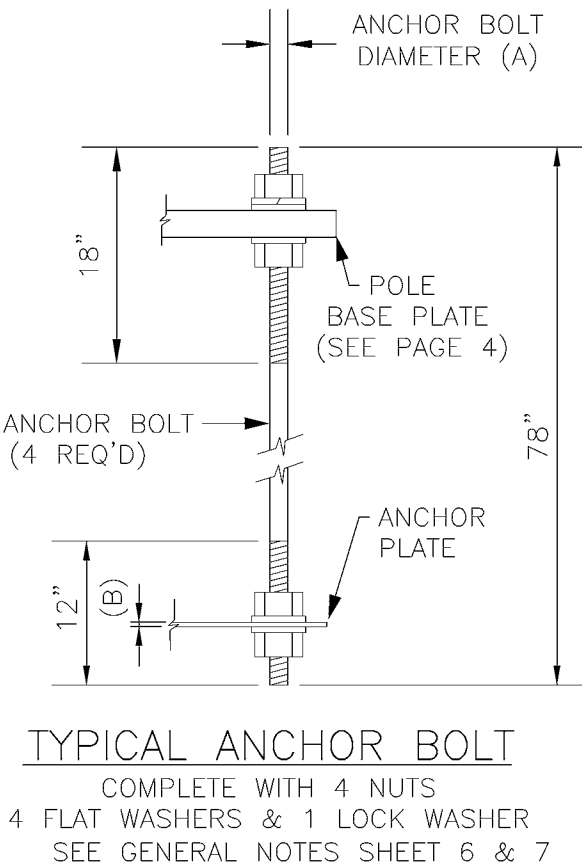
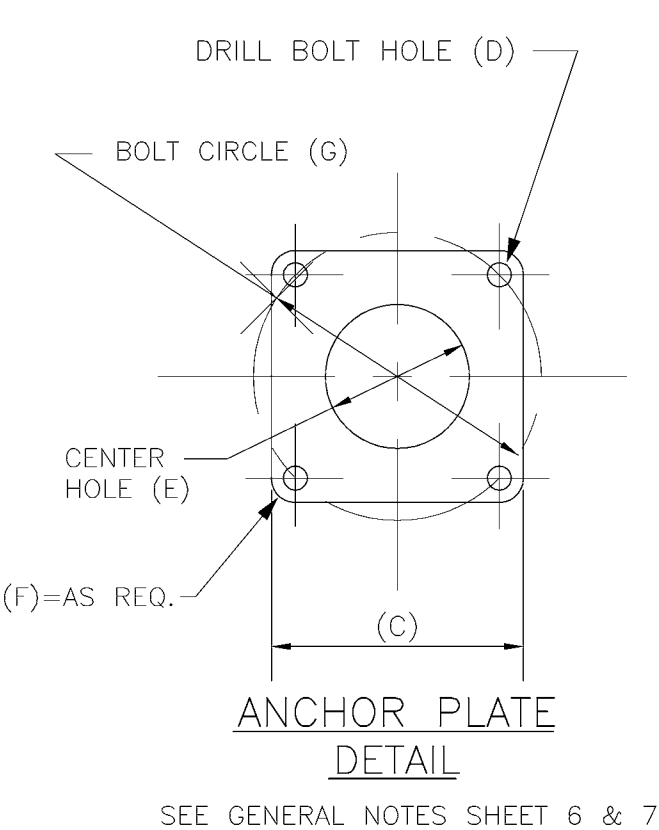
FILE

DWG. NO.

SA-213(S)

SHT 4 OF 7

FOUNDATION TYPE	ANCHOR BOLT DIAM. (INCHES) (A)	ANCHOR PLATE DIMENSIONS (INCHES)					
		PLATE THICK. (B)	PLATE WIDTH (C)	BOLT HOLE (D)	CENTER HOLE (E)	CORNER RADIUS (F)	BOLT CIRCLE (G)
SA-213-(S)	2 1/2	1/2	20 X 20	2 5/8	15	2 1/4	22



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DESIGNED DPG	CHKD:
DR: AJW	SCALE: NTS
RECOM.	CONTRACT:
APPROVED	



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SPECIAL FOUNDATION
(ANCHOR BASE
STEEL POLE)

DATE: JANUARY 04
FILE
DWG. NO. SA-213(S)
SHT 5 OF 7

GENERAL NOTES

1. CONCRETE AND REINFORCING STEEL

- 1.1 All work shall be done per City of Seattle Board of Public Works Rules:
Chapter 40.4 – Street and Sidewalk Pavement Opening and Restoration Rules
if in Street Right Of Way.
- 1.2 Concrete shall be City of Seattle Class AX air entrained, 3/4" max aggregate,
and with a minimum compressive strength of 4000 PSI at 28 days.
- 1.3 All reinforcing bars shall be deformed billet steel conforming to ASTM A615
Grade 60.
- 1.4 Minimum clear concrete cover shall be 3 inches.
- 1.5 Reinforcing details and fabrication shall be as recommended in ACI 315
"Details & Detailing of Concrete Reinforcement."
- 1.6 No construction joints shall be permitted.

2. ANCHOR PLATES, BOLTS, NUTS AND WASHERS

- 2.1 Anchor bolts including nuts and flat washers shall conform to ASTM F1554–99
Grade 105 Class 2A including supplementary requirements S2,S3,and S5.
Threads shall conform to the ANSI Standard B1.1 for UNC thread. Anchor bolts
shall have 18 inches of thread on exposed end and 12 inches of thread on the
embedded end.
- 2.2 Anchor plates shall conform to ASTM A36.

3. GALVANIZING

- 3.1 Anchor plates, anchor bolts, anchor bolt nuts and washers shall be hot-dip
galvanized in conformance to ASTM A153 or ASTM A123.

DESIGNED DPG	CHKD:	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SPECIAL FOUNDATION ANCHOR BASE STEEL POLE	DATE: JANUARY 04
DR: AJW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-213(S)
APPROVED				SHT 6 OF 7

GENERAL NOTES

4. SUBMITTALS

- 4.1 Reinforcing steel shop drawings and certificate of compliance.
- 4.2 Concrete mix proportions, admixtures and slump.
- 4.3 Anchor plate, anchor bolt, anchor bolt nuts and washers certificates of compliance.
- 4.4 A test report shall be provided in accordance with ASTM F1554-99 and supplementary requirements.

5. INSPECTION

- 5.1 Concrete shall not be placed until the Engineer has inspected the excavation, the grounding, the anchor bolts, and the placement of the reinforcing bar cage.

6. ANCHOR BOLT SETTING

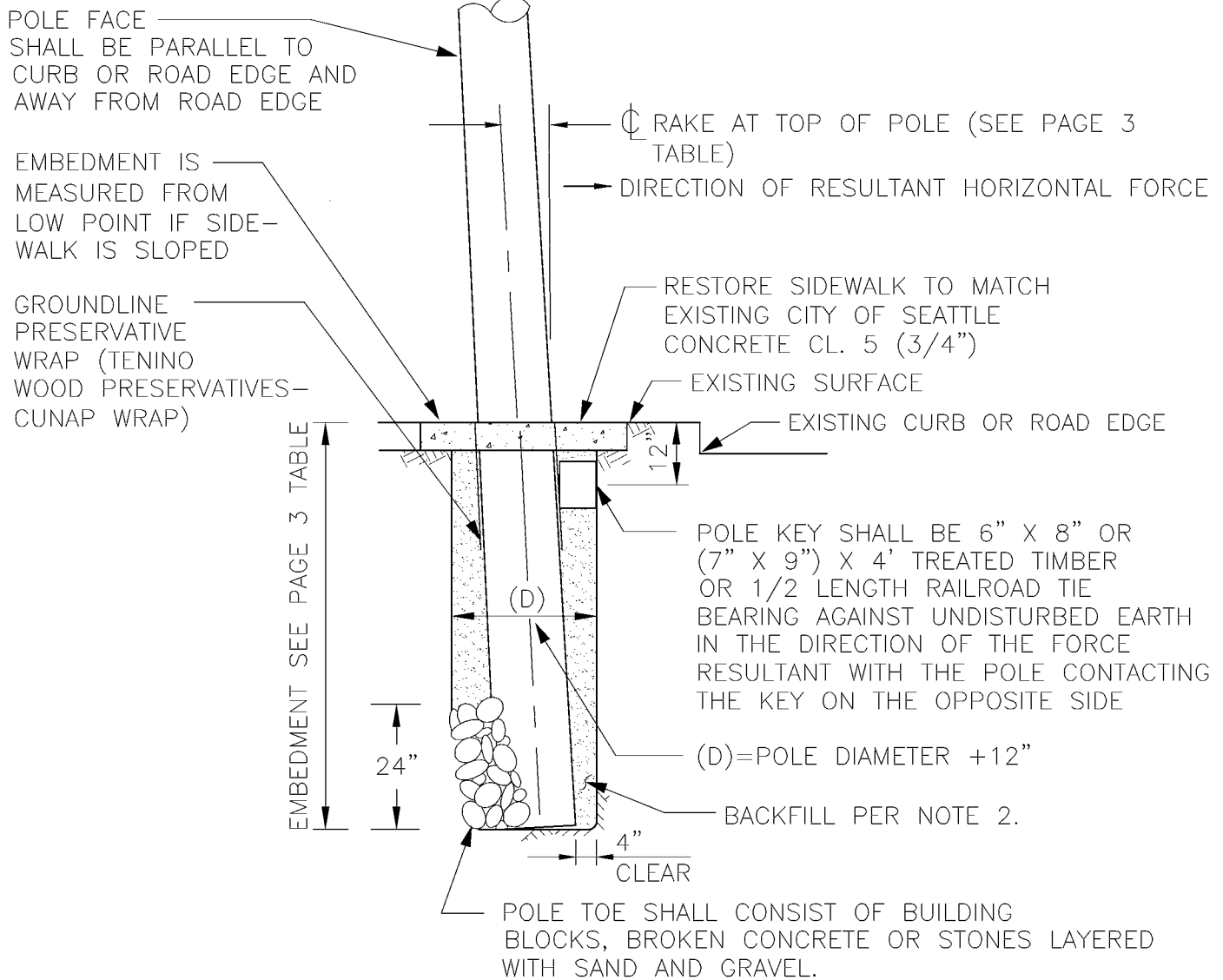
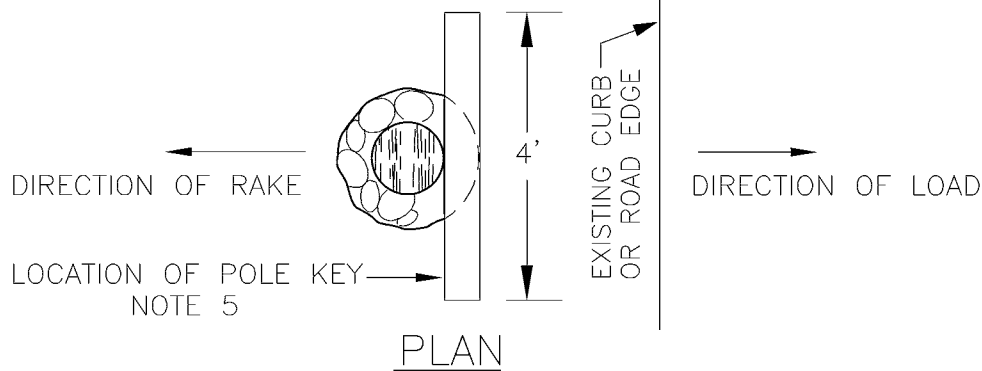
- 6.1 Cover exposed anchor bolt threads and nuts with at least 3 layers of plastic tape before placing concrete.
- 6.2 Anchor bolt template shall be used temporarily at the top of anchor bolts for accurate positioning and aligning.

7. CONDUIT

- 7.1 Conduit from foundation shall be schedule 80 PVC.
Conduit bends shall have a minimum radius of 12".

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DESIGNED DPG	CHKD:	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STANDARD FOUNDATION (ANCHOR BASE STEEL POLE)	DATE: JANUARY 04
DR: AJW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-213(S)
APPROVED				SHT 7 OF 7



NOTES

- SEE SHEET 3 FOR GENERAL NOTES.

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

WOOD POLE
SETTING STANDARD
(WITH SIDEWALK)

DATE:
JUN 95

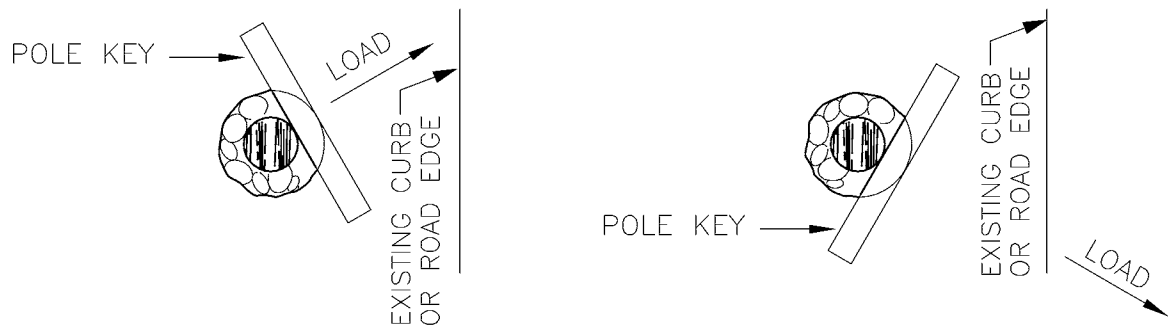
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DWG. NO.
SA-214

SHT 2 OF 3

NOTES:

1. THIS DETAIL APPLIES TO SOIL FREE OF PEAT, MUCK OR OTHER ORGANIC MATTER. SOILS HAVING THE ABOVE MENTIONED QUALITIES SHALL REQUIRE SPECIAL INVESTIGATION.
2. SOIL USED FOR BACKFILL SHALL BE WELL GRADED SAND AND GRAVEL MIX FREE FROM SOD, GRASS, WEEDS AND ALL SIMILAR ORGANIC MATERIALS AND SUITABLY DRY FOR COMPACTION. SAND AND GRAVEL MIX CAN BE EITHER EXCAVATED SOIL OR IMPORTED.
3. ALL WATER IN HOLE SHALL BE REMOVED BEFORE SETTING AND TAMPING THE HOLE.
4. IN BACKFILLING, THE SAND AND GRAVEL MIX SHALL BE REPLACED IN EVEN LAYERS APPROXIMATELY 6" THICK AND FIRMLY AND THOROUGHLY TAMPED TO A DRY DENSITY NOT LESS THAN THE NATURAL IN-PLACE DRY DENSITY OF THE SURROUNDING EARTH. IF HAND TAMPING BARS ARE USED, NOT MORE THAN ONE PERSON SHALL SHOVEL WHILE THREE PERSONS ARE TAMPING.
5. POLE KEY SHALL BE INSTALLED PERPENDICULAR TO DIRECTION OF LOAD, AND MAY NOT BE PARALLEL TO EXISTING CURB OR ROAD EDGE. SEE PLAN EXAMPLES BELOW.



6. DELETE POLE KEY & POLE TOE IF POLE IS GUYED WITH SA-231, SA-232, OR SA-233.

EMBEDMENT AND RAKE SCHEDULE				
POLE LENGTH (ft)	EMBEDMENT (ft)	RAKE		
		UNGUYED	GUYED	BRACKET ARM
35	8'-0"	17"	7"	7"
40	8'-0"	20"	8"	8"

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARD WOOD POLE SETTING STANDARD	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-214
APPROVED				SHT 3 OF 3

RAKE BACK FACE OF POLE
1/8" PER FT MAXIMUM

EXISTING
SIDEWALK

CONNECT GROUND
WIRE TO EXISTING
CAP SCREW

COLD TAR SHAFT
EXTERIOR TO 3" ABOVE
INSTALLATION GRADE
AND BOTTOM 18" OF
SHAFT INTERIOR

FOR FOUNDATION
DETAILS SEE
SA-212

1/2" X FULL DEPTH EXPANSION
JOINT MAT'L ALL AROUND AT
SIDEWALK/POLE SURFACE

POUR NON-SHRINK
GROUT KEY SEPARATELY

CITY OF SEATTLE CONCRETE
CLASS 5 (3/4"), 6" DEPTH,
4'x6' MINIMUM

4" DEPTH
EXPANSION
JOINT

EXISTING
CURB

THICKEN EDGE

FILL CONE WITH COMPACTED
DRY AND CLEAN SAND HAVING
THE FOLLOWING GRADING:

SIEVE SIZE	% PASSING
US NO. 8	95-100
US NO. 16	60-70
US NO. 30	15-25
US NO. 50	0-5
US NO. 100	0-2
US NO. 200	0-1

THE FRACTURE SHALL BE 10%.
THIS MATERIAL IS CRUSHED
SAND.

DESIGNED
A WOLAK

DR:
B FARISSB

RECOM.

APPROVED
J DAVIS

CHKD:
D GREER

SCALE:
NONE

IBIS NO:

CONTRACT NO:



METRO TRANSIT DIVISION
TROLLEY STANDARDS
EMBEDDED STEEL POLE
INSTALLATION
WITH SIDEWALK

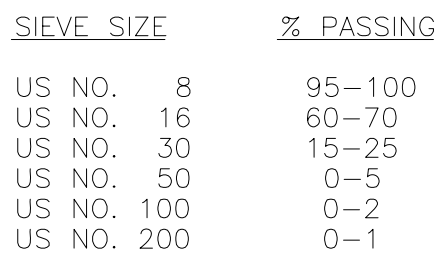
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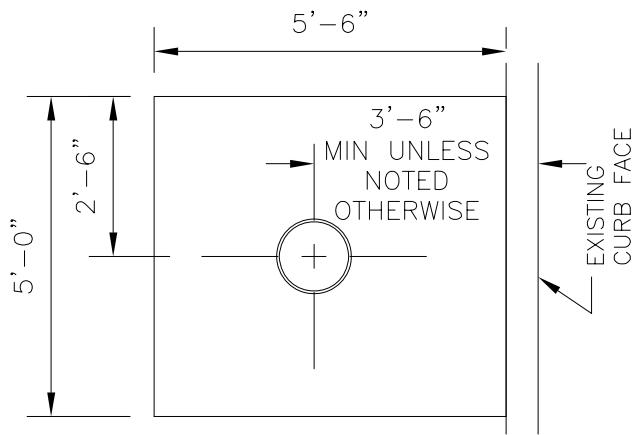
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SA-215

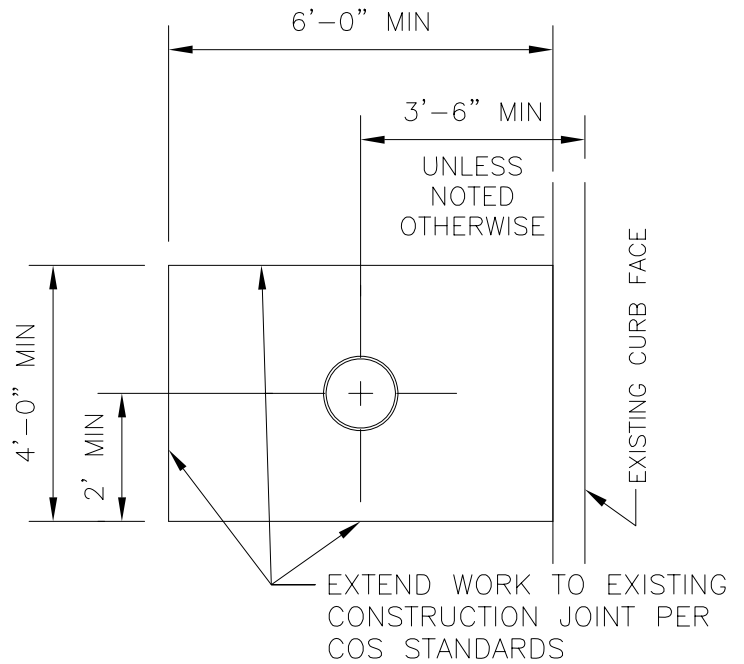
SHT 1 OF 3



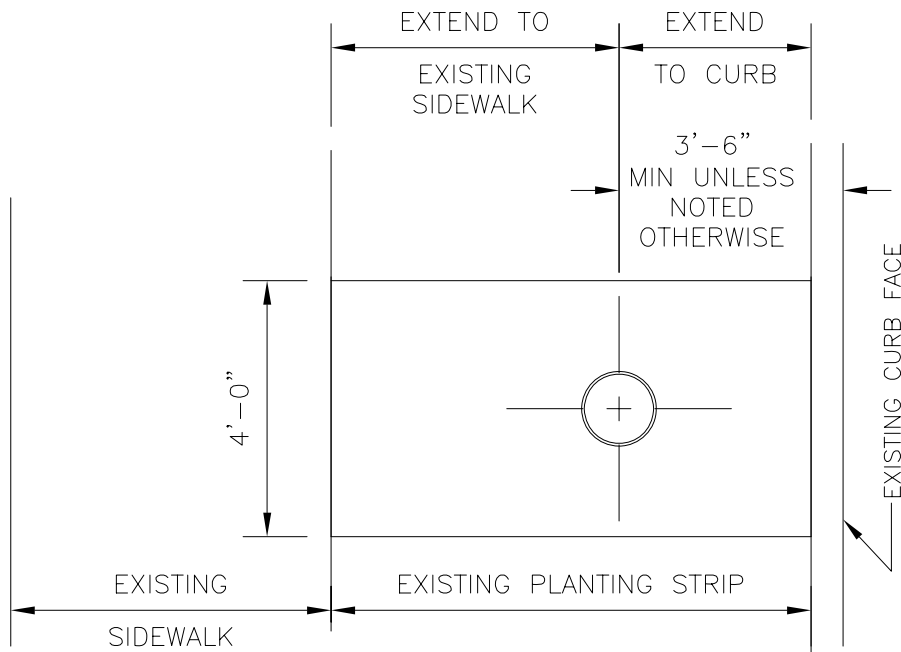
DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION	DATE: JUNE 2008
DR: B FARISSB	SCALE: NONE		TROLLEY STANDARDS	FILE
RECOM.	IBIS NO:		EMBEDDED STEEL POLE INSTALLATION	DWG. NO. SA-215
APPROVED J DAVIS	CONTRACT NO:		WITHOUT SIDEWALK	SHT 2 OF 3




NO SIDEWALK
CONDITION



EXISTING SIDEWALK
CONDITION



EXISTING SIDEWALK
& PLANTING STRIP
CONDITION

DESIGNED A WOLAK	CHKD: D GREER	 King County	METRO TRANSIT DIVISION TROLLEY STANDARDS EMBEDDED STEEL POLE INSTALLATION	DATE: APRIL 2008
DR: B FARISB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-215
APPROVED J DAVIS	CONTRACT NO:			SHT 3 OF 3

RAKE FACE OF POLE AS SHOWN
UNLESS DWG SHOWS OTHERWISE.
(RAKE IS Min. 1/8" PER FT,
Max. 3/16" PER FT, FOR BRACKET
ARM POLES SA-341, SA-342
& SA-343)

CONNECT GROUND
WIRE TO EXISTING
CAP SCREW

PROVIDE A CONCRETE
PAD. SEE SHEET 4.
NOTE: PAD TO MATCH
EXIST. SIDEWALK & CURB.
USE CITY OF SEATTLE
CONCRETE CL 5 (3/4")

EXISTING
SURFACE

2" CONC
SAND

Max. 1/4" 12"
Min. 3/16" 12"

LOCKWASHER & (2)
FLAT WASHERS. WRAP
PERIPHERY TO PREVENT
CONCRETE ON SURFACE.
(TYPICAL)

WRAP ANCHOR BOLT
PERIPHERY WITH TAPE
TO PREVENT CONCRETE
AND SAND UNDER POLE
AND IN THREADS

EXISTING
CURB

EXISTING ANCHOR BOLTS

FOR FOUNDATION
DETAILS SEE
SA-213

BURIED CONDITION

USE ONLY WHERE NOTED ON DWGS

DESIGNED
DPG

CHKD:
DOW

DR:
CMS

SCALE:
NONE

RECOM.

IBIS NO:

APPROVED
MB

CONTRACT NO:



King County

METRO TRANSIT DIVISION
TROLLEY STANDARDS

ANCHOR BASE
STEEL POLE INSTALLATION

DATE:
JULY 97

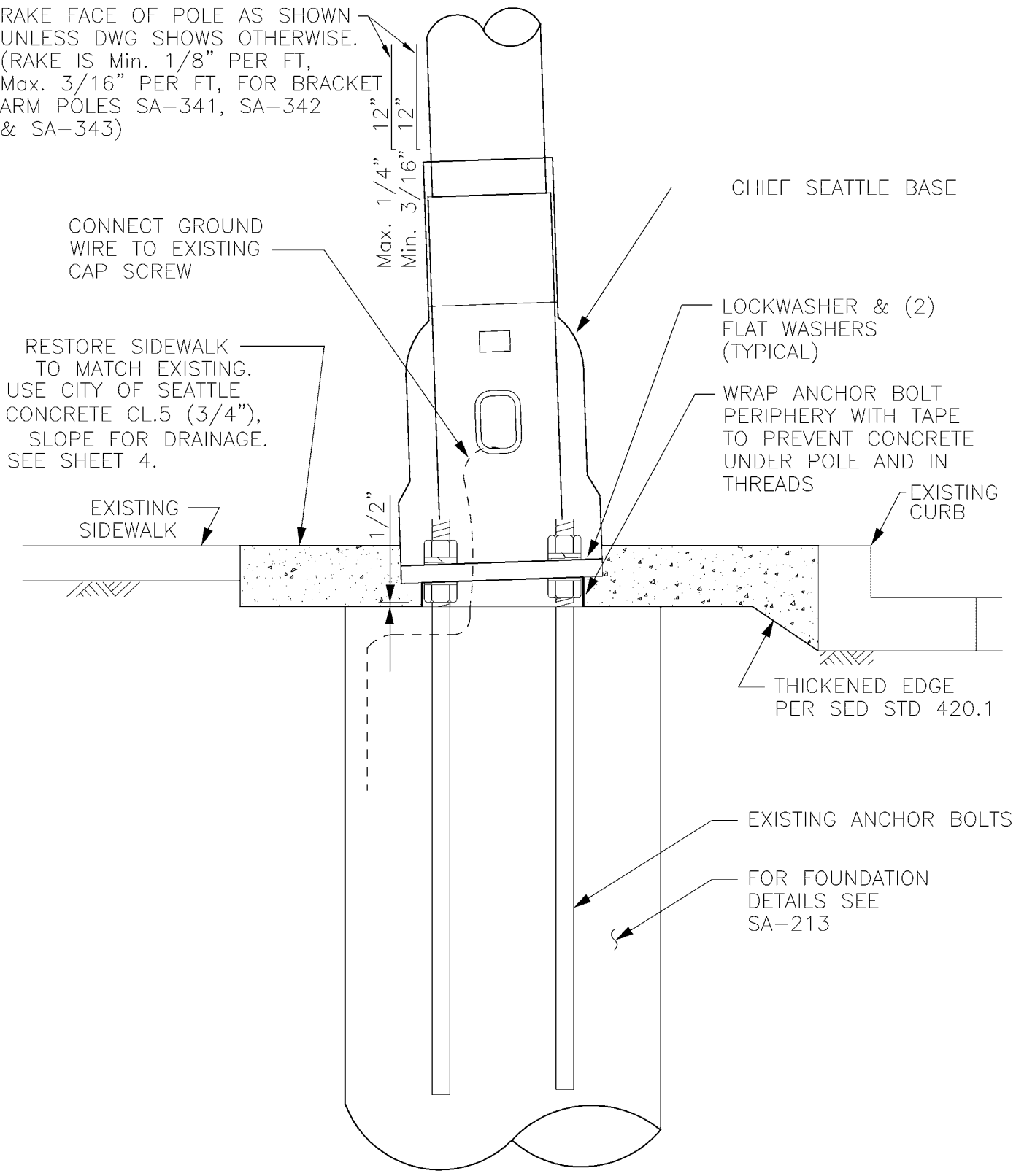
FILE

DWG. NO.

SA-216

SHT 2 OF 4

RAKE FACE OF POLE AS SHOWN UNLESS DWG SHOWS OTHERWISE. (RAKE IS Min. 1/8" PER FT, Max. 3/16" PER FT, FOR BRACKET ARM POLES SA-341, SA-342 & SA-343)



CHIEF SEATTLE CONDITION

USE ONLY WHERE NOTED ON DWGS

DESIGNED DPG	CHKD: DOW
DR: CMS	SCALE: NONE
RECOM.	IBIS NO:
APPROVED MB	CONTRACT NO:

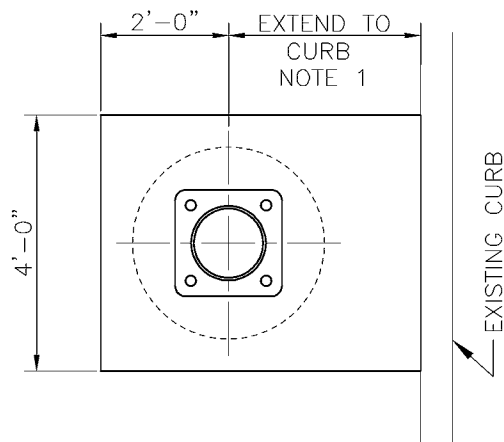


King County

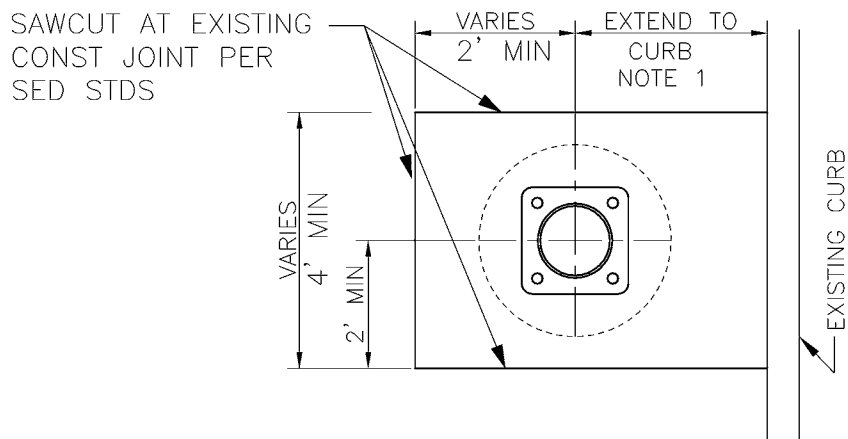
METRO TRANSIT DIVISION
TROLLEY STANDARDS

ANCHOR BASE STEEL POLE INSTALLATION

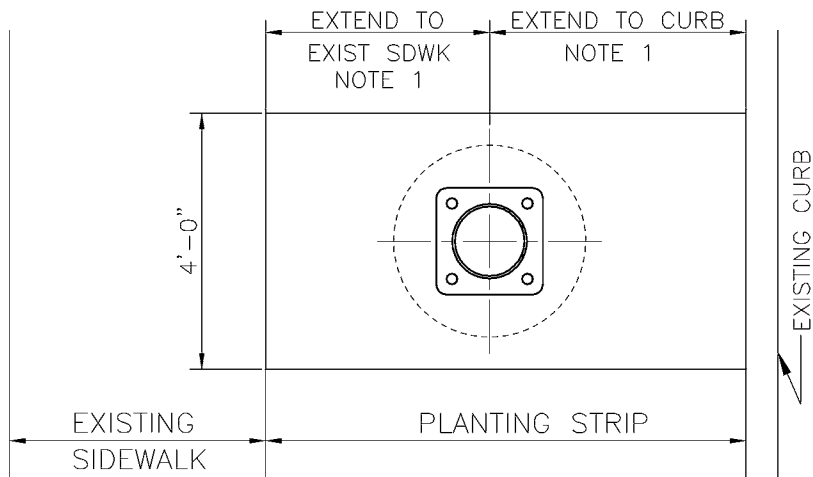
DATE: JULY 97
FILE
DWG. NO. SA-216
SHT 3 OF 4



NO SIDEWALK CONDITION



EXISTING SIDEWALK CONDITION



EXISTING SIDEWALK & PLANTING STRIP CONDITION

NOTE 1: 2 FT MIN DIMENSION MAY BE USED IF DIMENSION EXCEEDS 6 FT.

DESIGNED
DPG

CHKD:
DOW

DR:
CMS

SCALE:
NONE

RECOM.

IBIS NO:

APPROVED
MB

CONTRACT NO:



King County

METRO TRANSIT DIVISION
TROLLEY STANDARDS

ANCHOR BASE
STEEL POLE INSTALLATION

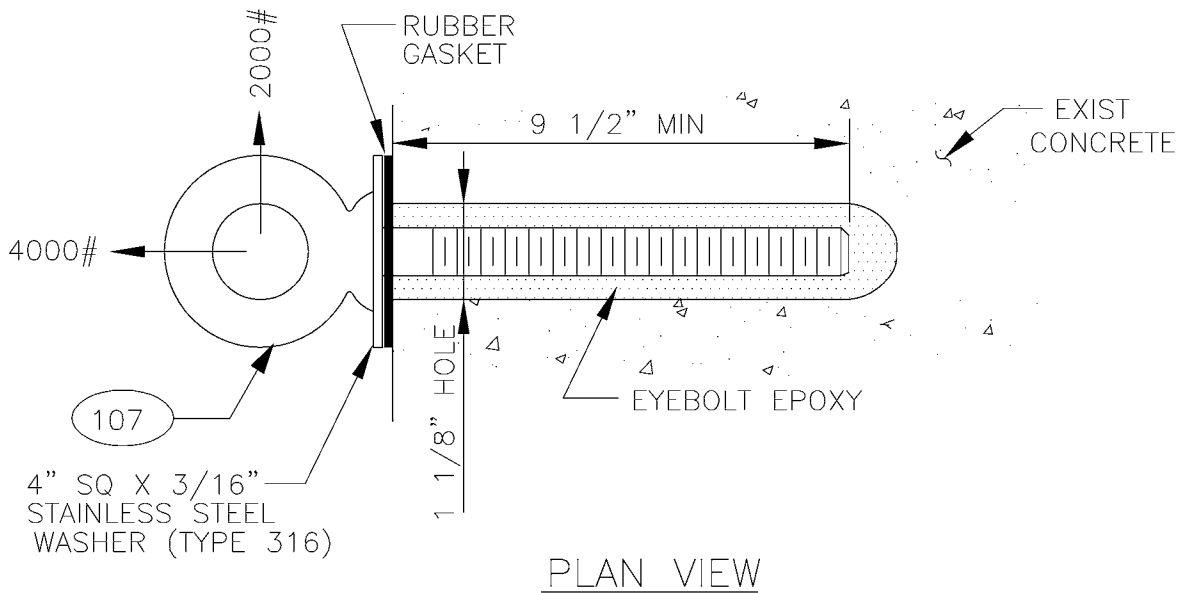
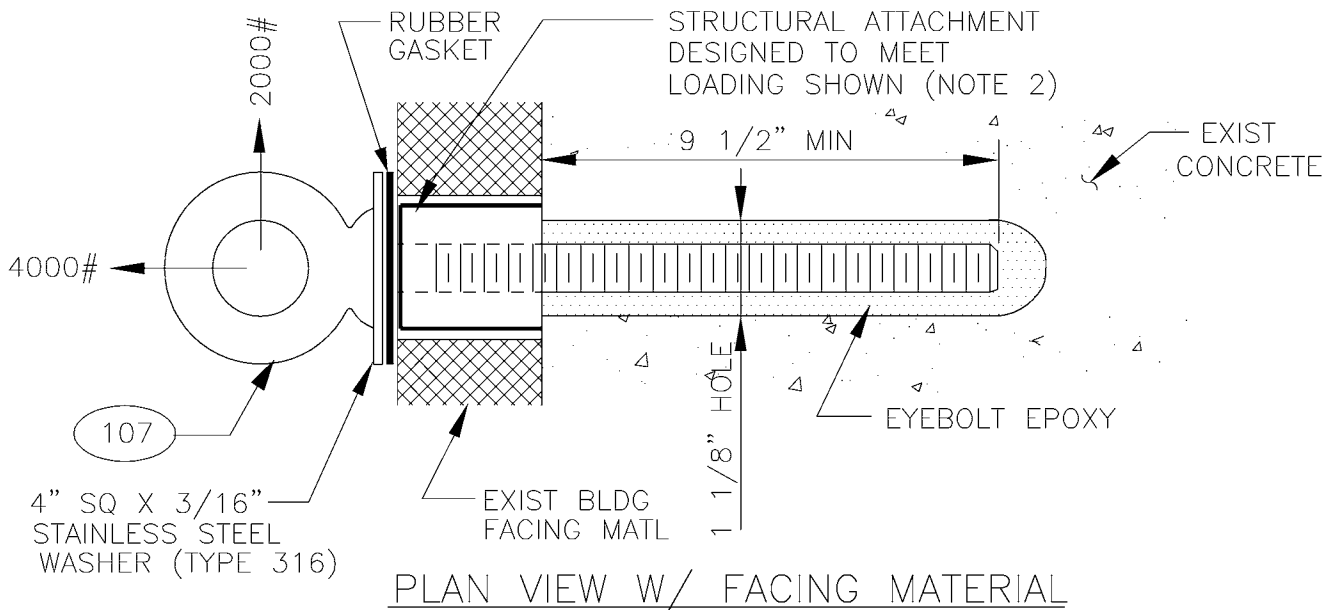
DATE:
JAN 97

FILE

DWG. NO.

SA-216

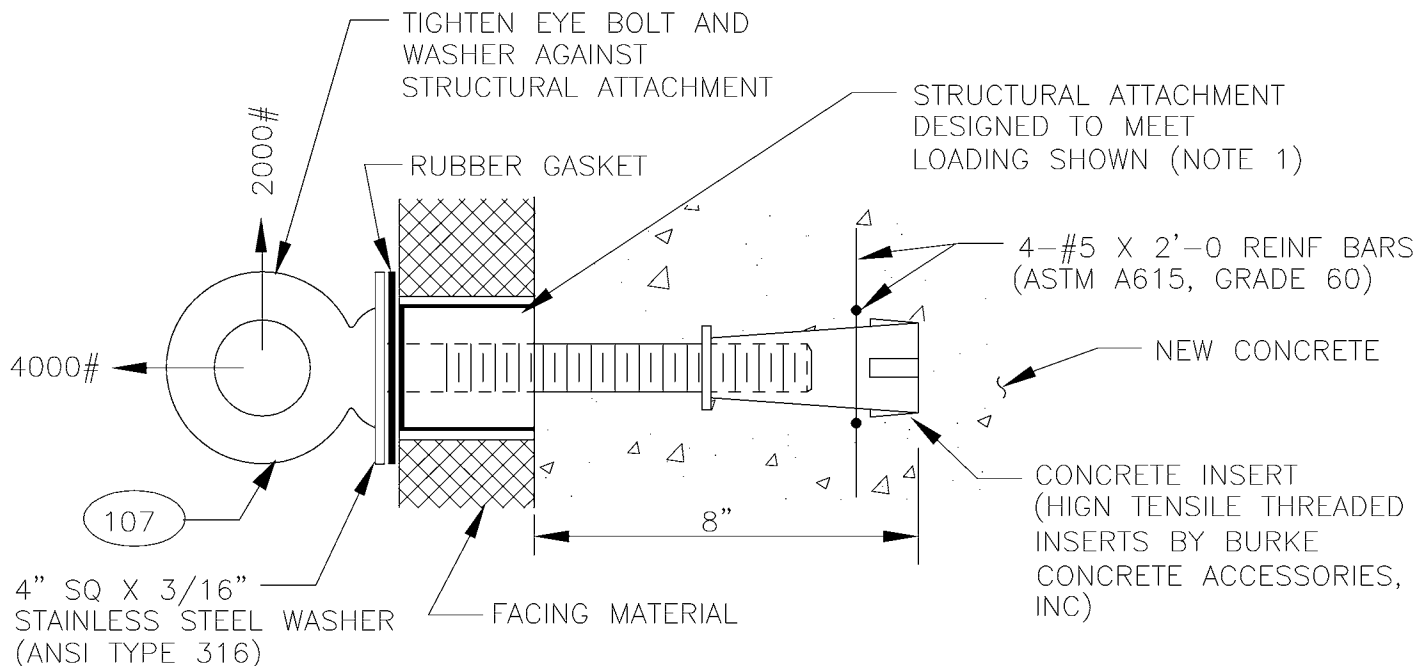
SHT 4 OF 4



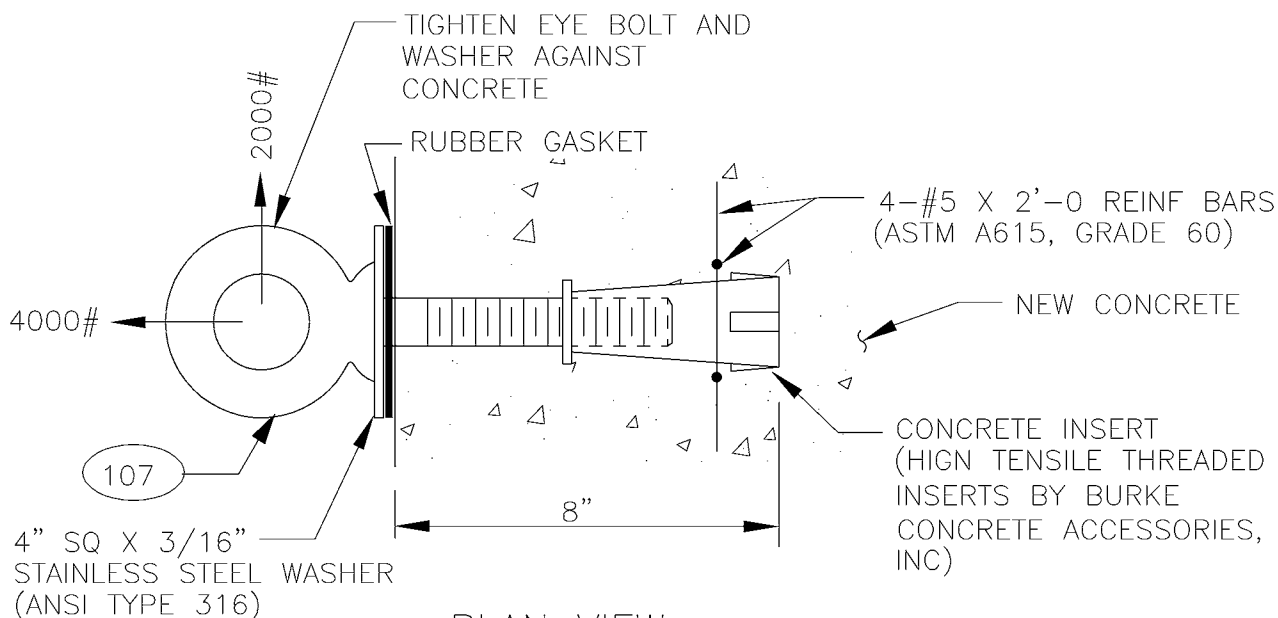
NOTES:

1. INSTALL EYEBOLT EYE IN A HORIZONTAL ORIENTATION.
2. USE ITW RAMSET/REDHEAD EPCON EPOXY ANCHORING SYSTEM TO SET THE EYEBOLT. AN EPCON E101 HAND TOOL INJECTOR WITH AN E24 NOZZLE SHALL BE USED TO INJECT CERAMIC 6 EPOXY. INSTALL PER THE MANUFACTURES RECOMMENDATIONS.
3. TO PREVENT SPALLING, DEFLECTION RESULTING FROM SHEAR LOADING SHALL NOT ALLOW THE EYEBOLT TO CONTACT BUILDING FACING MATERIAL.
4. EYEBOLT SHOULDER SHALL BE SEATED.
5. A TWO FOOT MINIMUM SPACING IS REQUIRED BETWEEN EYEBOLTS.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JAN 98
DR: TMB	SCALE: NONE		BLDG EYEBOLT INSTALLATION (EXISTING CONCRETE STRUCTURE)	FILE
RECOM.	CONTRACT:			DWG. NO. SA-221
APPROVED				SHT 1 OF 5



PLAN VIEW W/FACING



PLAN VIEW

NOTES:

1. TO PREVENT SPALLING, DEFLECTION RESULTING FROM SHEAR LOADING SHALL NOT ALLOW THE EYEBOLT TO CONTACT BUILDING FACING MATERIAL.
2. INSTALL EYEBOLT EYE IN A HORIZONTAL ORIENTATION.
3. A TWO FOOT MINIMUM SPACING IS REQUIRED BETWEEN EYEBOLTS.

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

BLDG EYEBOLT INSTALLATION
(NEW CONCRETE
STRUCTURE)

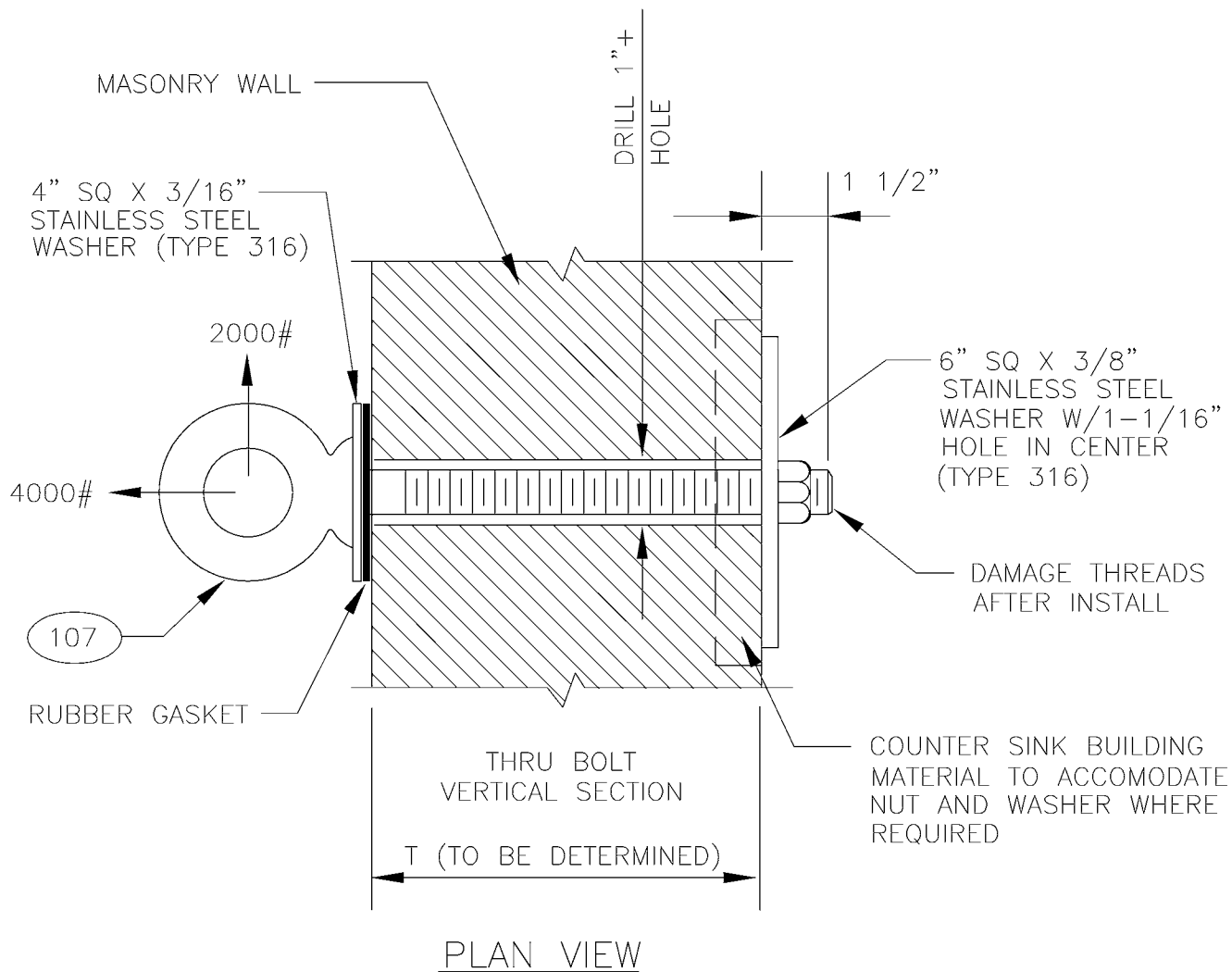
DATE:
JUN 97

FILE

DWG. NO.

SA-221

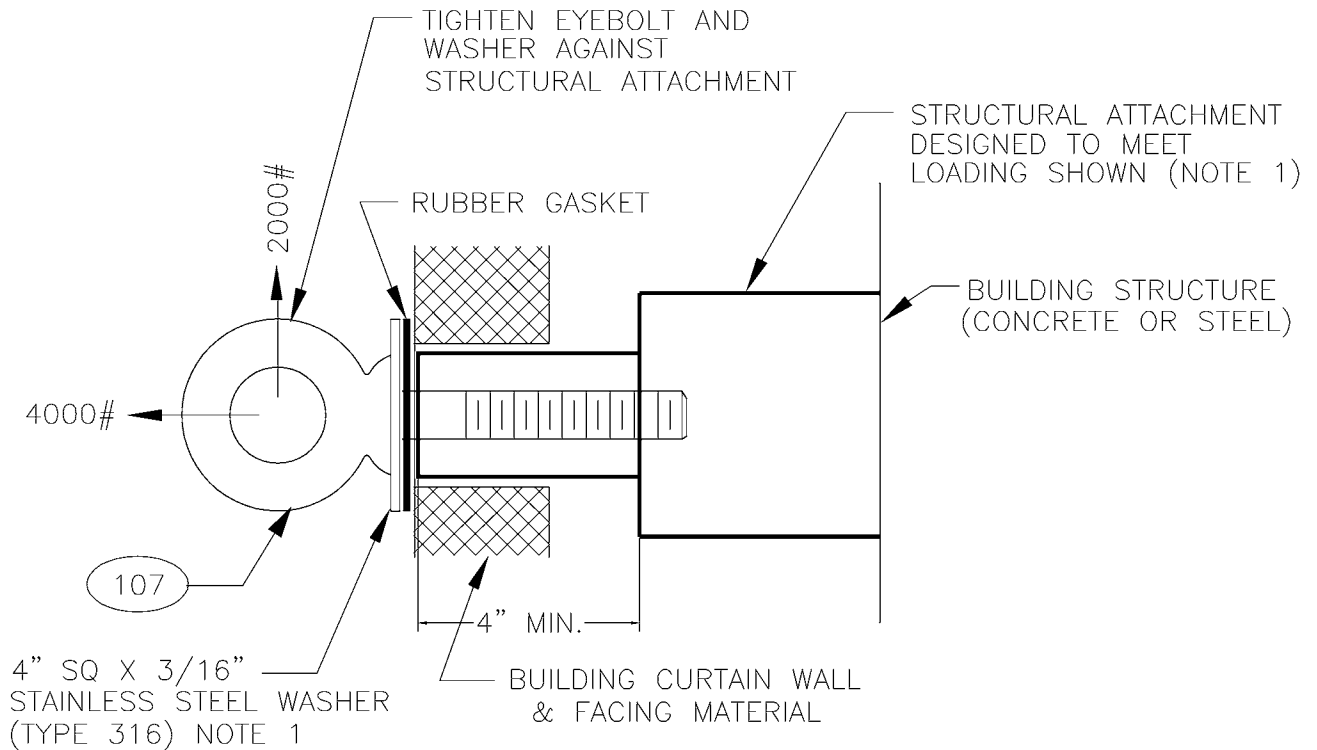
SHT 2 OF 5



NOTES:

1. A TWO FOOT MINIMUM SPACING IS REQUIRED BETWEEN EYEBOLTS.
2. INSTALL EYEBOLT EYE IN A HORIZONTAL ORIENTATION.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JUN 97
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:		BLDG EYEBOLT INSTALLATION (MASONRY STRUCTURE)	DWG. NO. SA-221
APPROVED				SHT 3 OF 5



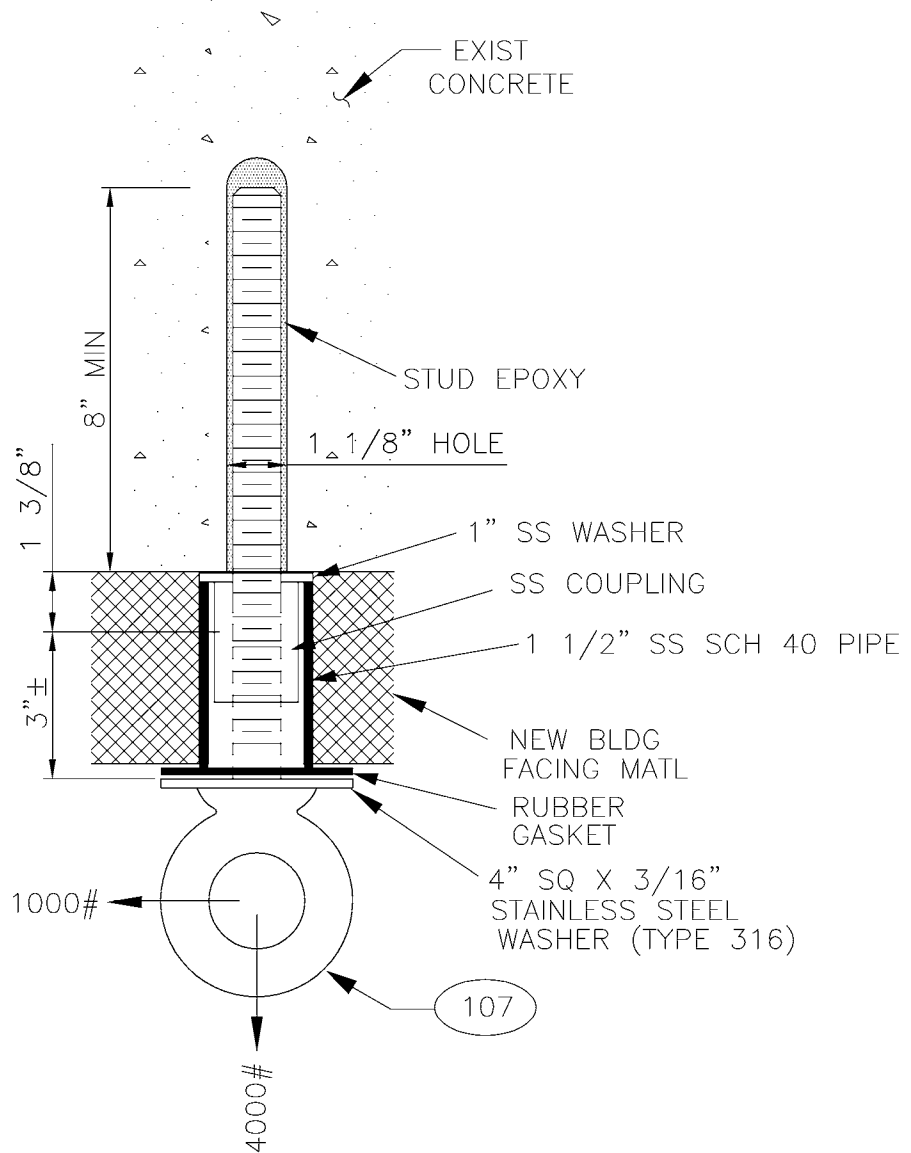
PLAN VIEW

NOTES:

1. TO PREVENT BREAKAWAY, DEFLECTION RESULTING FROM SHEAR FORCE SHALL NOT ALLOW THE STRUCTURAL ATTACHMENT TO CONTACT EXISTING BUILDING FACING MATERIAL.
2. INSTALL EYEBOLT EYE IN A HORIZONTAL ORIENTATION.
3. A TWO FOOT MINIMUM SPACING IS REQUIRED BETWEEN EYEBOLTS.

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JUN 97
DR: TMB	SCALE: NONE		BLDG EYEBOLT INSTALLATION (CURTAIN WALL STRUCTURE)	FILE
RECOM.	CONTRACT:			DWG. NO. SA-221
APPROVED				SHT 4 OF 5



PLAN VIEW W/ FACING MATERIAL

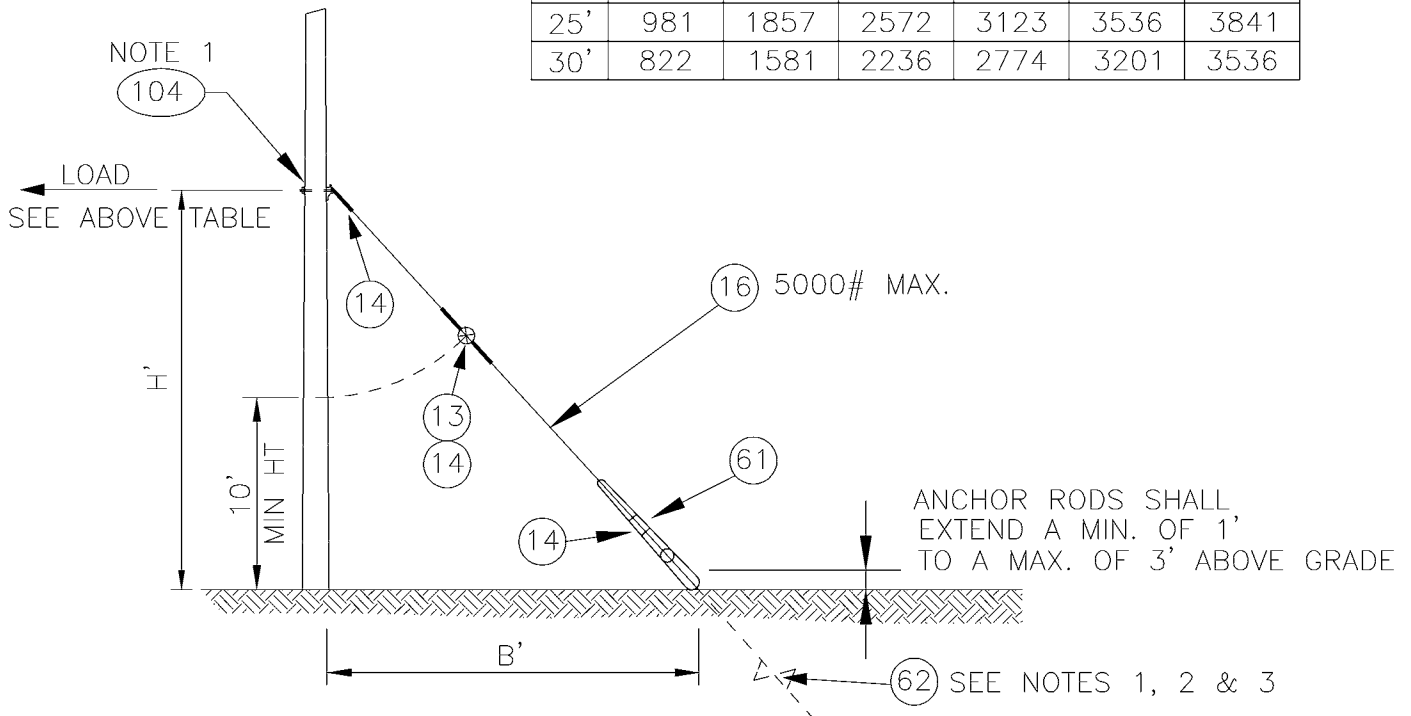
NOTES:

1. INSTALL EYEBOLT EYE IN A HORIZONTAL ORIENTATION.
2. USE ITW RAMSET/REDHEAD EPCON EPOXY ANCHORING SYSTEM TO SET THE STUD. AN EPCON E101 HAND TOOL INJECTOR WITH AN E24 NOZZLE SHALL BE USED TO INJECT CERAMIC 6 EPOXY. INSTALL PER THE MANUFACTURES RECOMMENDATIONS.
3. TO PREVENT SPALLING, DEFLECTION RESULTING FROM SHEAR LOADING SHALL NOT ALLOW THE EYEBOLT TO CONTACT BUILDING FACING MATERIAL.
4. EYEBOLT SHOULDER SHALL BE SEATED.
5. A TWO FOOT MINIMUM SPACING IS REQUIRED BETWEEN ADJACENT EYEBOLTS.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JAN 98
DR: DOW	SCALE: 3" = 1'			FILE
RECOM. DPG	CONTRACT:		BLDG EYEBOLT INSTALLATION (EXISTING CONCRETE STRUCTURE WITH FACING)	DWG. NO. SA-221
APPROVED				SHT 5 OF 5

ALLOWABLE LOADS/ ITEM 16

H \ B	5'	10'	15'	20'	25'	30'
15'	1581	2774	3536	4000	4287	4472
20'	1213	2236	3000	3536	3904	4160
25'	981	1857	2572	3123	3536	3841
30'	822	1581	2236	2774	3201	3536



NOTES

1. INSTALLATION HEIGHT AND LOCATION OF ANCHOR IS INDICATED ON THE OVERHEAD DWGS.
2. SCREW ANCHOR SHALL HAVE TWO 8" HELIXES FOR GLACIAL TILL WITH A 1-1 1/2" HUB CAPABLE OF DEVELOPING 7000 FT-LBS MAXIMUM WORKING TORQUE. THE ANCHOR ROD SHALL BE 1" DIA. WITH A TRIPLE EYE.
3. MINIMUM INSTALLATION TORQUE FOR THE SCREW ANCHORS SHALL BE 3500 FOOT-LBS THIS TORQUE VALUE WILL REQUIRE THE USE OF 7 SHEAR PINS FOR USE WITH THE A.B. CHANCE TORQUE INDICATOR, CATALOG # C303-044.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
13	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	4	GUY GRIP DEADEND	PREFORMED	CDE-3115
16	VARIES	GUY STRAND	COPPERWELD	16M
61	1	GUY GUARD, 8 FT, FOR USE ON 3/16" TO 1/2" STRAND	PREFORMED	PG 5518
62	1	POWER INSTALLED SCREW ANCHOR	CHANCE	E102-1219
104	VARIES	WOOD POLE DOWNGUY ASSEMBLY	METRO STD	SA-104

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

DOWN GUY

DATE:

OCT 95

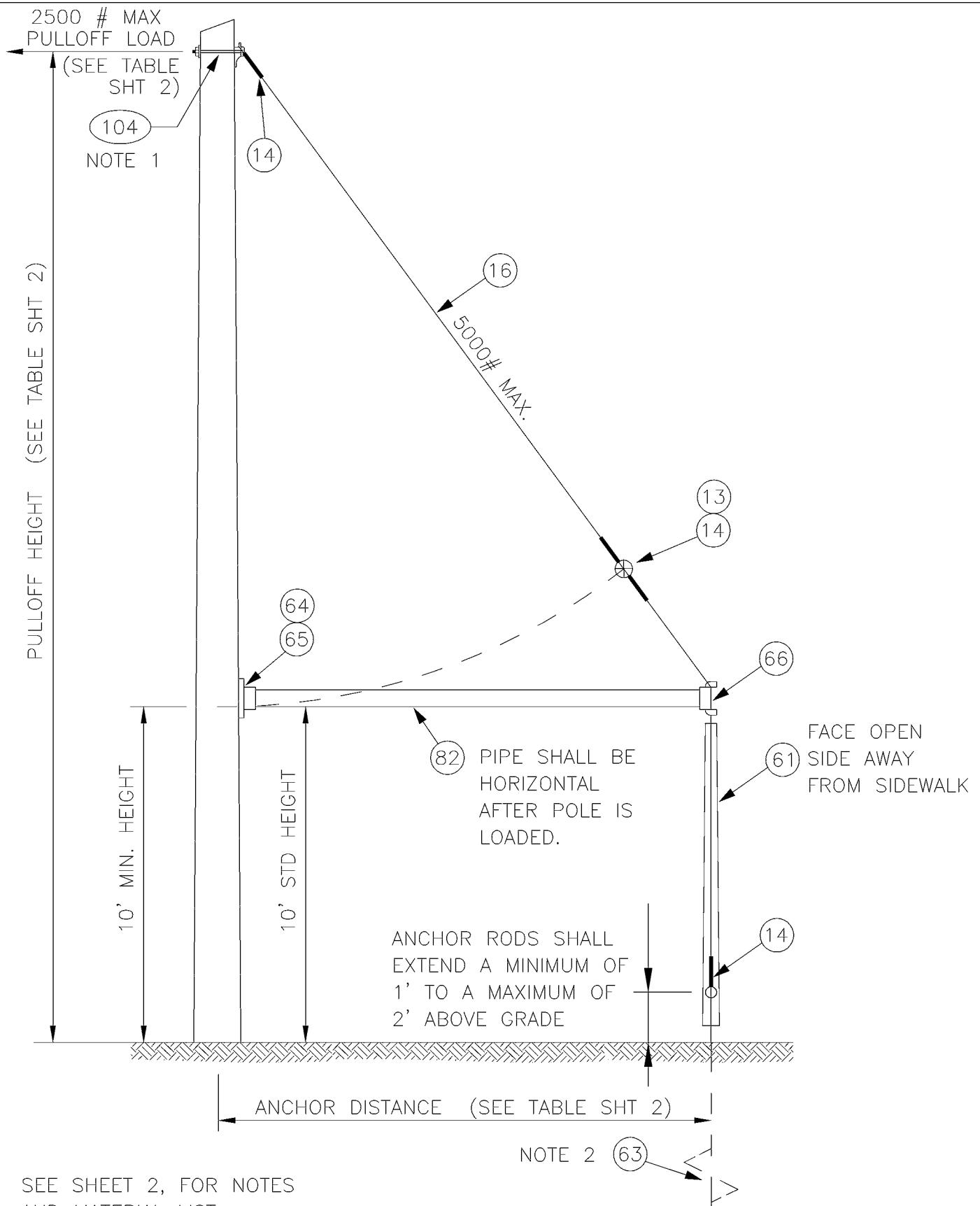
FILE

DWG. NO.

SA-231

SHT 1 OF 1

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DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SIDEWALK GUY

DATE:
OCT 95

FILE

DWG. NO.

SA-232

SHT 1 OF 2

NOTES:

1. INSTALLATION HEIGHT AND LOCATION OF ANCHOR IS INDICATED ON THE OVERHEAD DRAWINGS.
2. SCREW ANCHOR SHALL HAVE TWO 8" HELIXES FOR GLACIAL TILL WITH A 1 1/2" HUB CAPABLE OF DEVELOPING 7000 FT-LBS MAX. WORKING TORQUE. THE ANCHOR ROD SHALL BE 1" DIAMETER WITH A TRIPLE EYE. MINIMUM INSTALLATION TORQUE FOR S

ALLOWABLE PULLOFF LOADING PER GUY

	*	*	*	*	*	*	*
		*	*	*	*	*	*
2236			*	*	*	*	*
1923	2236			*	*	*	*
1682	1970	2236	2480	2500	*	*	*
1491	1756	2004	2236	2451	2500	*	*
1338	1581	1812	2030	2236	2428	2500	*
1213	1437	1652	1857	2052	2236	2410	2500

* = MAXIMUM LOAD OF 2500 # APPLIES.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
13	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	4	GUY GRIP DEADEND	PREFORMED	CDE-3115
16	VARIES	GUY STRAND	COPPERWELD	16M
61	1	GUY GUARD, 8 FT, FOR USE ON 3/16" TO 1/2" STRAND	PREFORMED	PG 5518
63	1	POWER INSTALLED SCREW ANCHOR	CHANCE	C102-1260
64	1	POLE PLATE, 2 1/2" PIPE	JOSLYN	J0521
65	4	LAG SCREW, FETTER DRIVE, 1/2" x 4"	JOSLYN	J8754
66	1	END FITTING, 2 1/2" PIPE	COOPER POWER SYSTEM	DG5G1
82	VARIES	2 1/2" DIA ASTM A53 GRB STD WT GALV STEEL PIPE		
104	VARIES	WOOD POLE DOWNGUY ASSEMBLY	METRO STD	SA-104

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SIDEWALK GUY

DATE:
OCT 96

FILE

DWG. NO.

SA-232


SHT 2 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
17	4	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC	HPTG 6700I
56	4	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC	PLP 2755
90	1	HEAVY PIPE CLAMP, GALV, 3" IPS	GRINNELL	FIG. 216
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103. INSTALLATION HEIGHT IS 1 FOOT ABOVE THE BRACKET ARM UNLESS DWGS SPECIFY OTHERWISE.

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS BRACKET ARM GUY	DATE: JAN 97
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-234
APPROVED				SHT 2 OF 2

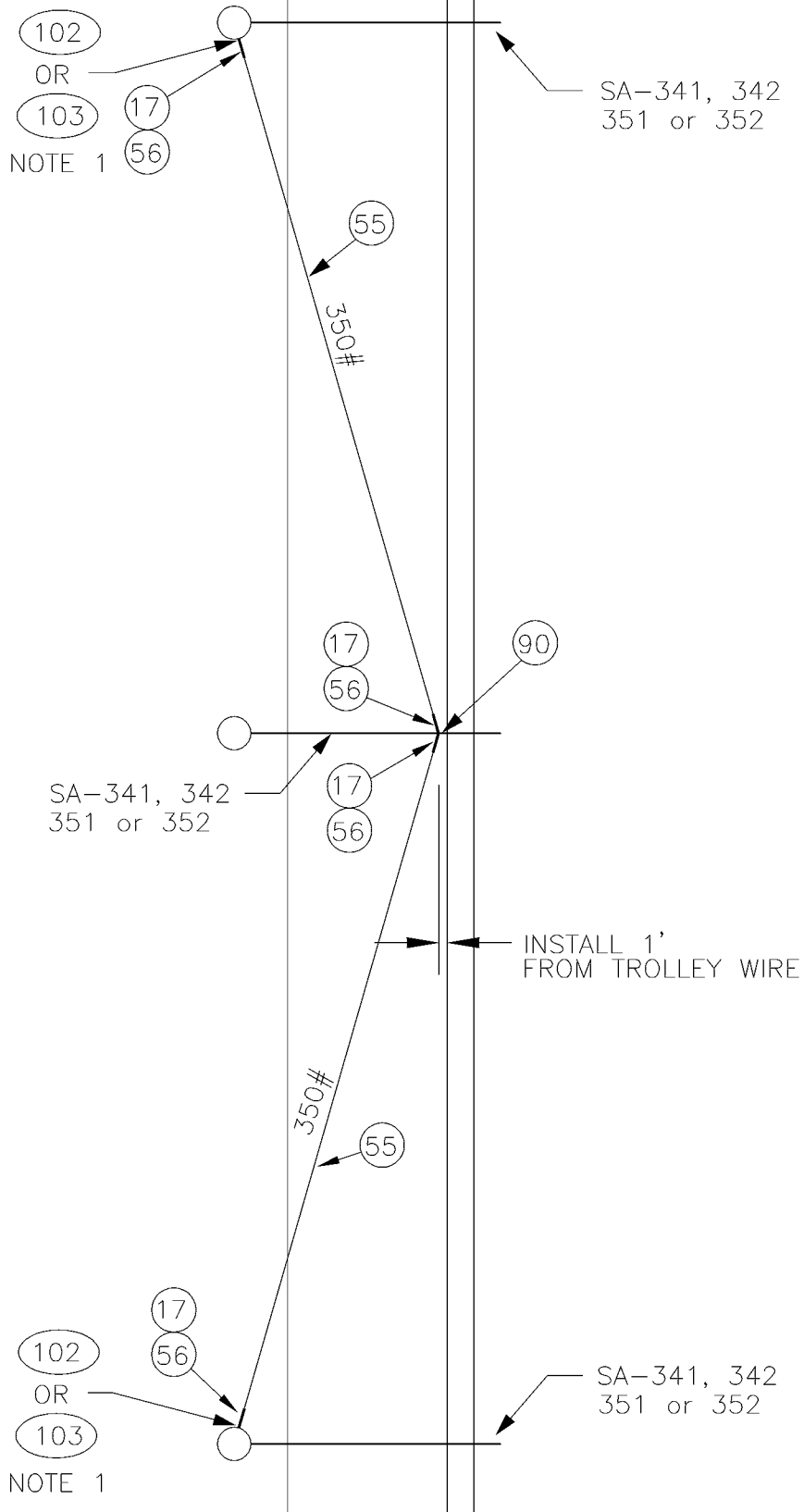
NOTES

- 1 A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. GUY TENSION IS INDICATED ON THE OVERHEAD DRAWINGS.
- 2 PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE TWO WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
- 3 SEE SA-167 FOR INSULATED GUY CRITERIA.


MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
SA-233L-----GUY TENSIONS 0-2500 LBS				
03	2	GUY STRAIN INSUL	WABCO	31504-3060
04	5	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" 6 WRAPS		
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M-NOTE 3
SA-233H-----GUY TENSIONS 2500-5000 LBS				
06	AS REQD	FRICTION TAPE, 3/4" 6 WRAPS		
13	2	GUY STRAIN INSUL	WABCO	31506-3060
14	5	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M-NOTE 3
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
ALSO SA-233L & SA-233H				
102	VARIES	STEEL POLE COLLAR	METRO	SA-102
103	VARIES	WOOD POLE EYEBOLT	METRO	SA-103

DESIGNED DG	CHKD: DW	 King County	METRO TRANSIT DIVISION TROLLEY OVERHEAD SYSTEM STANDARDS STANDARD HEAD GUY	DATE: JUN 93
DR: TMB	SCALE: NONE			FILE
RECOM.	IBIS NO:			DWG. NO. SA-233
APPROVED	CONTRACT NO:			SHT 1 OF



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DESIGNED DPG	 Municipality of Metropolitan Seattle		DATE: JUN 95
DRA: DOW	CHKD: .	SCALE: NONE	FILE .
RECOM.	TROLLEY STANDARDS		DWG. NO. SA-234
APPROVED			SHT 1 OF 2


BRACKET ARM GUY

MATERIAL LIST

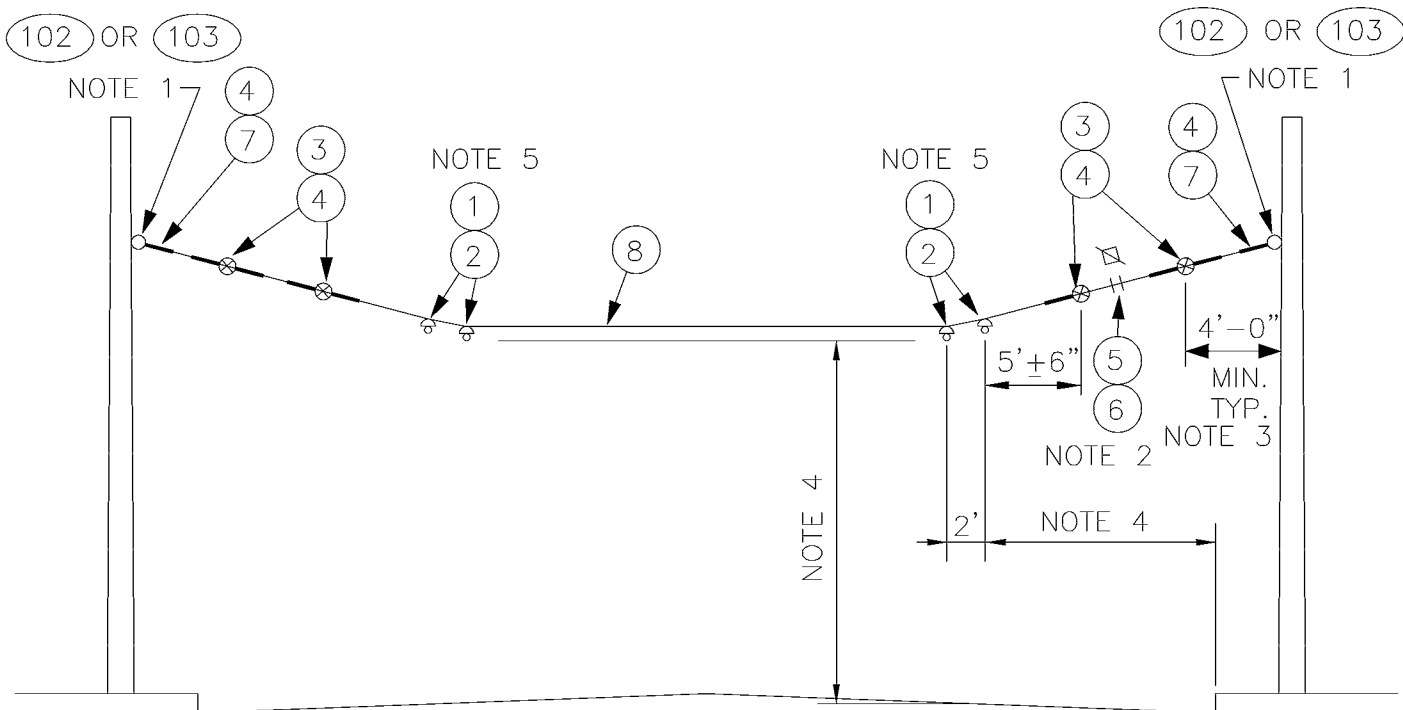
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
17	4	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC	HPTG 67001
56	4	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC	PLP2755
90	1	HEAVY PIPE CLAMP, GALV 3" IPS	GRINNELL	FIG. 216
102	VARIES	FORGED 3-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD EYEBOLT	METRO STD	SA-103

NOTE

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103. INSTALLATION HEIGHT IS 1 FOOT ABOVE THE BRACKET ARM UNLESS DRAWINGS SPECIFY OTHERWISE.

DESIGNED DPG	 Municipality of Metropolitan Seattle		DATE: JUN 95
DRA: DOW	CHKD: .	SCALE: NONE	FILE
RECOM.	BRACKET ARM GUY		DWG. NO. SA-234
APPROVED			SHT 2 OF 2
	TROLLEY STANDARDS		

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NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. MAXIMUM ANGLE IS 0.5°. SEE SA-307, PLAN VIEW.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
02	4	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	9	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

TANGENT SPAN
TWO-WAY TRAFFIC

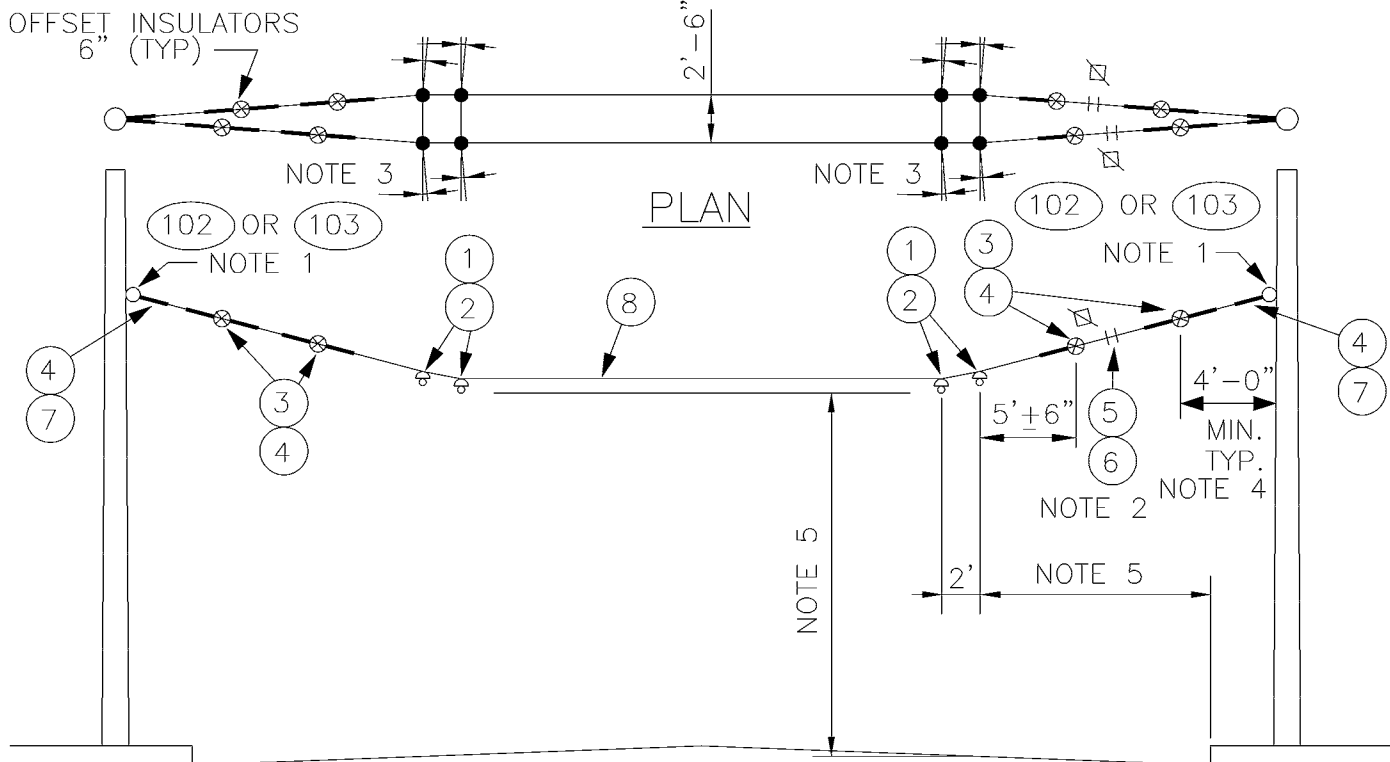
DATE:
OCT 95

FILE

DWG. NO.

SA-301

SHT 1 OF 1



NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌘". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. MAXIMUM ANGLE 1°, 0.5° PER SPAN HANGER.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	8	DETROIT CLAMP ASSY	WABCO	19293-3007
02	8	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	8	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	18	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

HOLDUP TANGENT SPAN
TWO-WAY TRAFFIC

DATE:

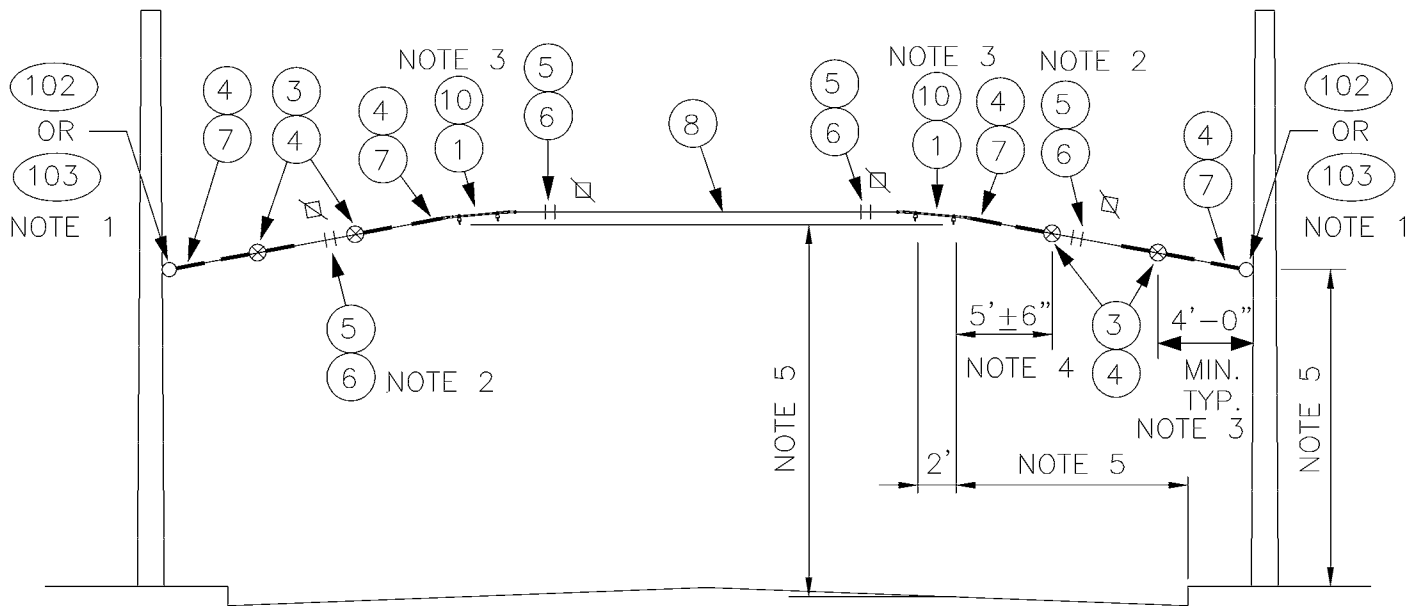
OCT 95

FILE

DWG. NO.

SA-302

SHT 1 OF 1



NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌵". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. MAXIMUM ANGLE 0.5 DEGREE. SEE SA-307, PLAN VIEW.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	8	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	2	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

INVERTED TANGENT SPAN
TWO-WAY TRAFFIC

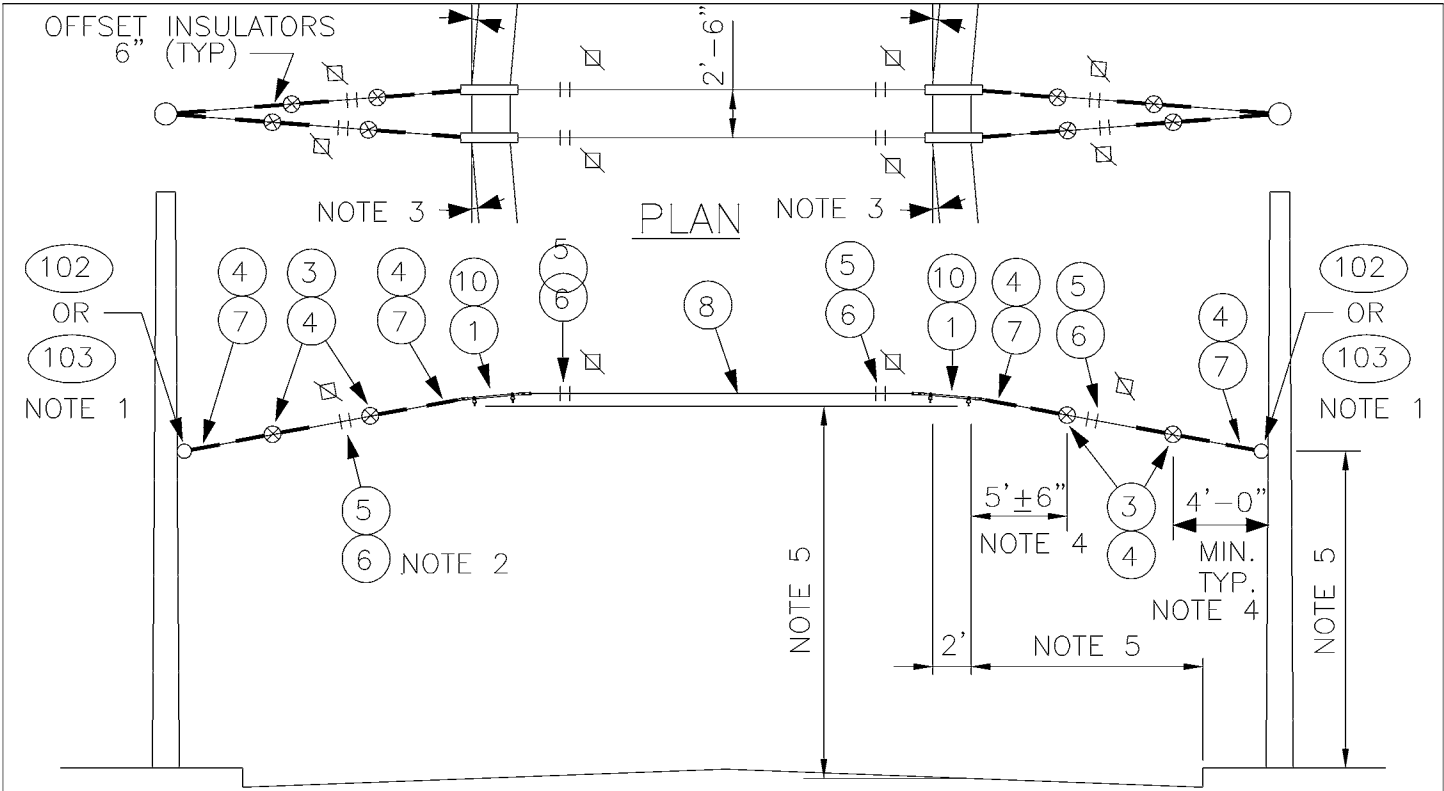
DATE:
OCT 95

FILE

DWG. NO.

SA-303

SHT 1 OF 1

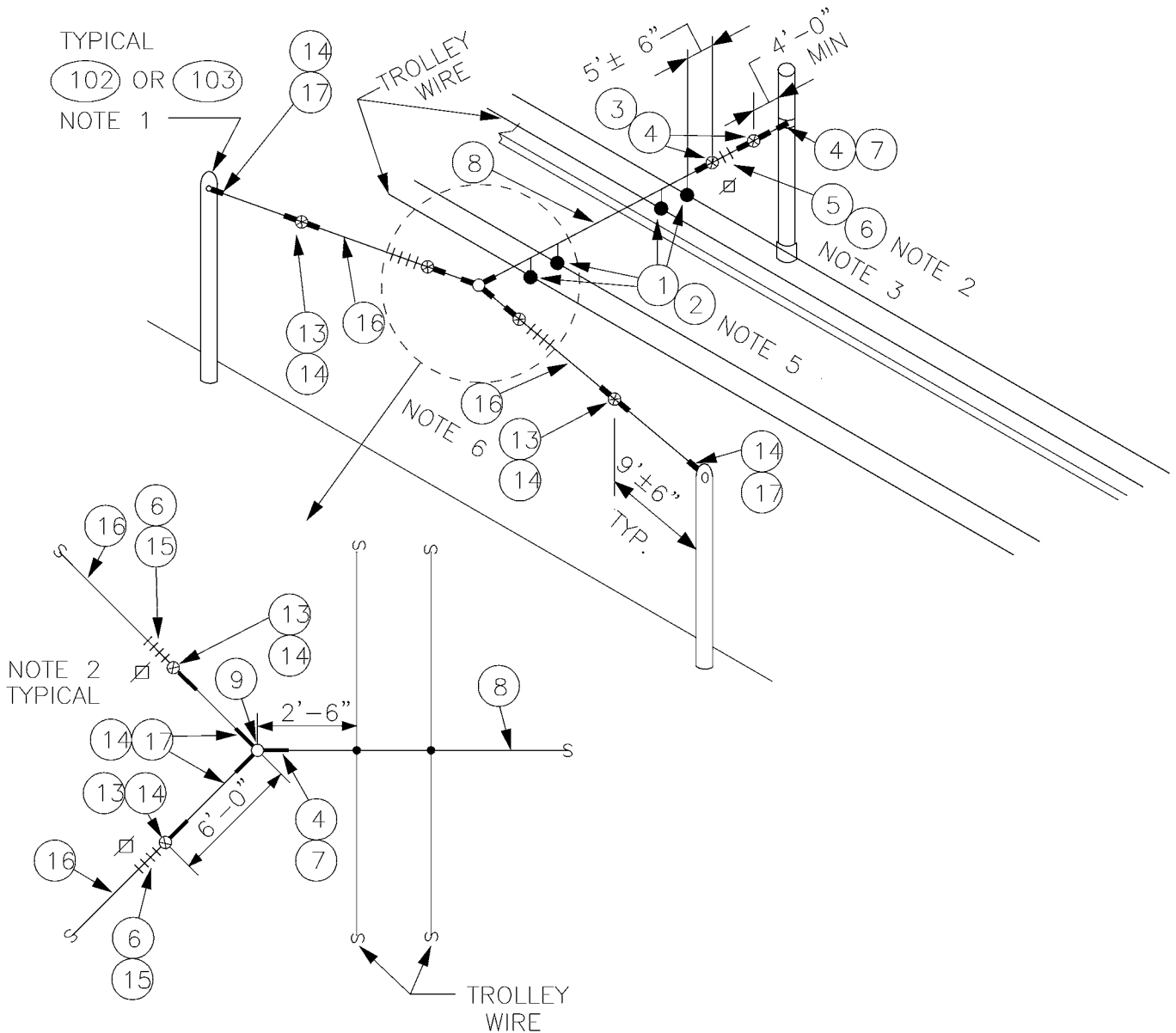


- NOTES**
1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
 2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌵". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
 3. MAXIMUM ANGLE 1°, 0.5° PER DOUBLE CURVE HANGER.
 4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
 5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	8	DETROIT CLAMP ASSY	WABCO	19293-3007
03	8	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	20	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	16	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	8	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	4	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG	CHKD: DOW	 <p>King County</p>	<p>DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS</p> <p>HOLDDOWN TANGENT SPAN TWO-WAY TRAFFIC</p>	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-304
APPROVED				SHT 1 OF 1



DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

BRIDLE TANGENT SPAN
TWO-WAY TRAFFIC

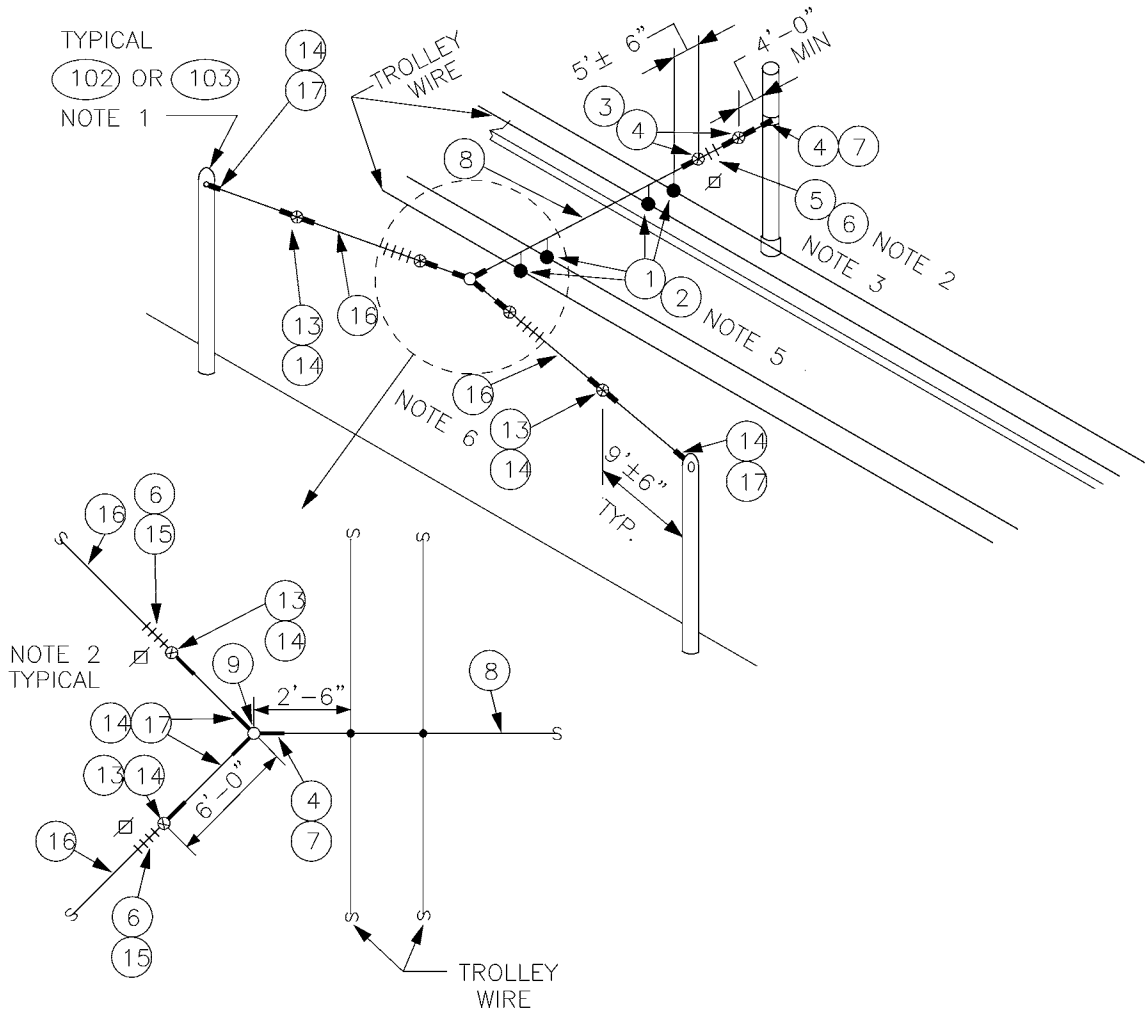
DATE:
JUN 95

FILE

DWG. NO.

SA-305

SHT 1 OF 2



DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

BRIDLE TANGENT SPAN
TWO-WAY TRAFFIC

DATE:
OCT 95

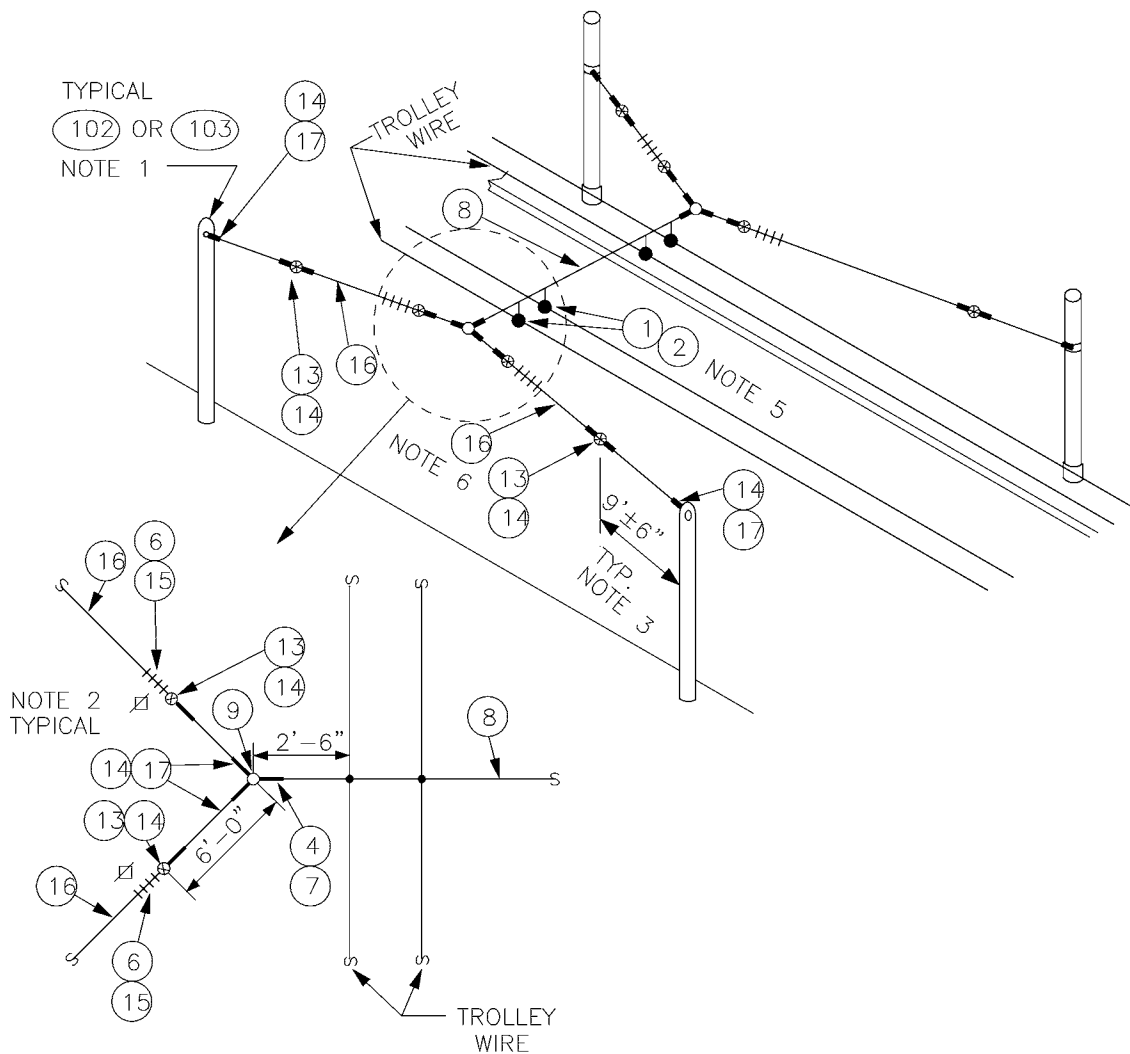
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DWG. NO.

SA-305

SHT 2 OF 2

TYPICAL
 (102) OR (103)
 NOTE 1



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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DOUBLE BRIDGE TANGENT SPAN TWO-WAY TRAFFIC	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-306
APPROVED				SHT 1 OF 2

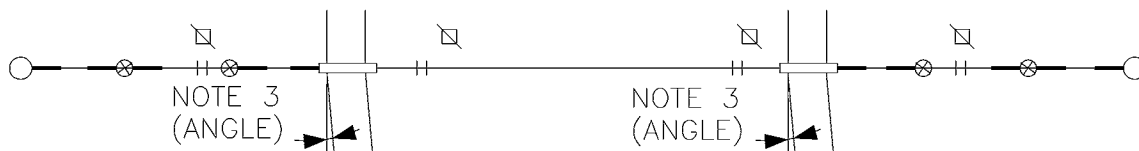
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
02	4	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	VARIES	GUY STRAIN INSUL	PORCELAIN 504 PRODUCTS CO.	
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	VARIES	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	2	BULL RING	WABCO	18567-2000
13	VARIES	GUY STRAIN INSUL	PORCELAIN 506 PRODUCTS CO.	
14	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	VARIES	WIRE ROPE CLIP, 3/8"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M
17	VARIES	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

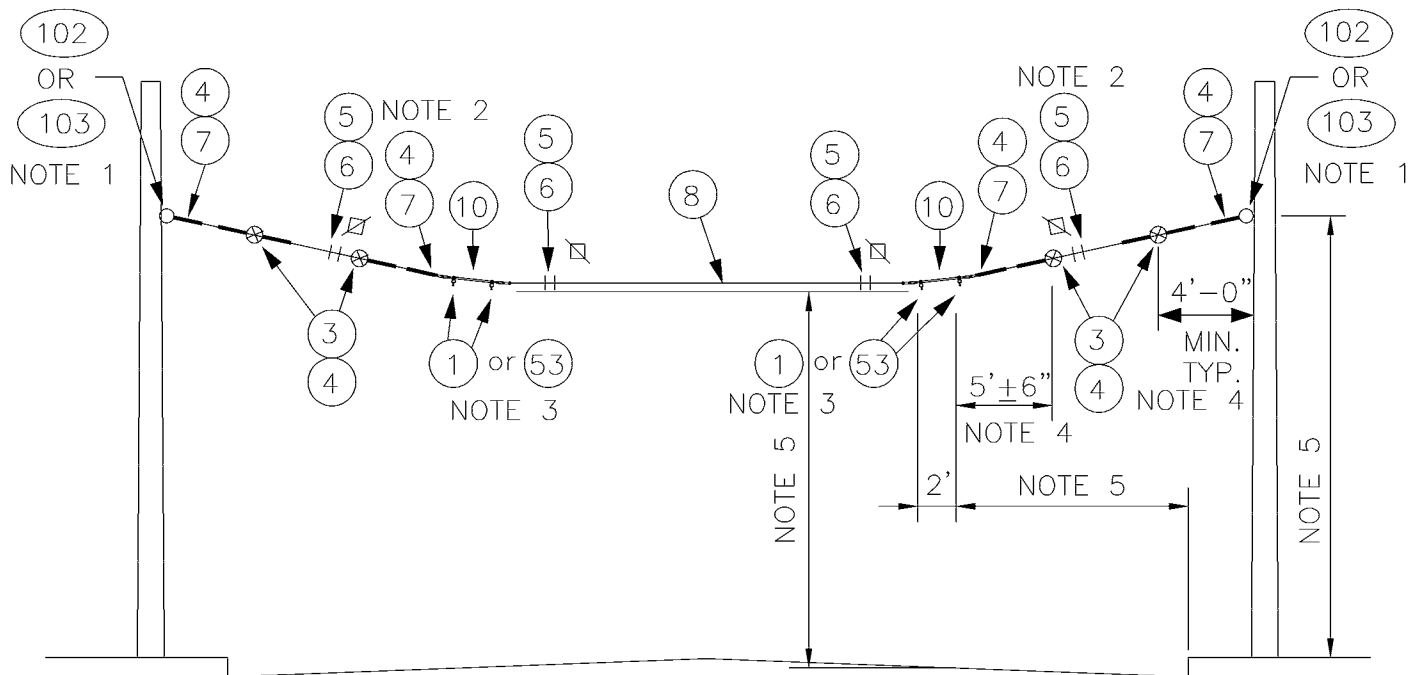
NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. MAXIMUM ANGLE IS 0.5°. SEE SA-307, PLAN VIEW.
6. IF LOAD SHOWN ON OVERHEAD DRAWINGS IS LESS THAN 2500 LBS, THEN ITEM 8 MAY BE USED INSTEAD OF ITEM 16. THE ASSOCIATED ITEMS SHALL ALSO BE CHANGED I.E. 3 FOR 13, 4 FOR 14, 5 FOR 15 AND 7 FOR 17.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:		DOUBLE BRIDLE TANGENT SPAN	DWG. NO. SA-306
APPROVED			TWO-WAY TRAFFIC	SHT 2 OF 2



PLAN




ELEVATION

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌘". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. ANGLE VARIES FROM 1° TO 5°. USE ITEM 1 FOR 1° TO 2.5° ANGLE. USE ITEM 53 FOR 3° TO 5° ANGLE.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

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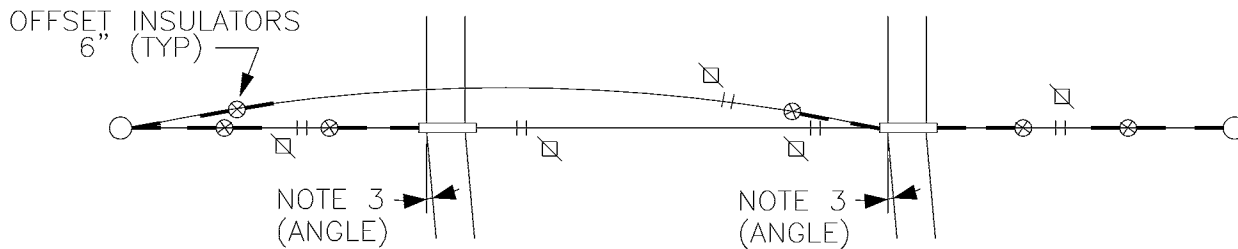
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:		1° TO 5° CURVE SPAN WITH TWO FOOT CURVE RAILS TWO-WAY TRAFFIC	DWG. NO. SA-307
APPROVED				SHT 1 OF 2

MATERIAL LIST

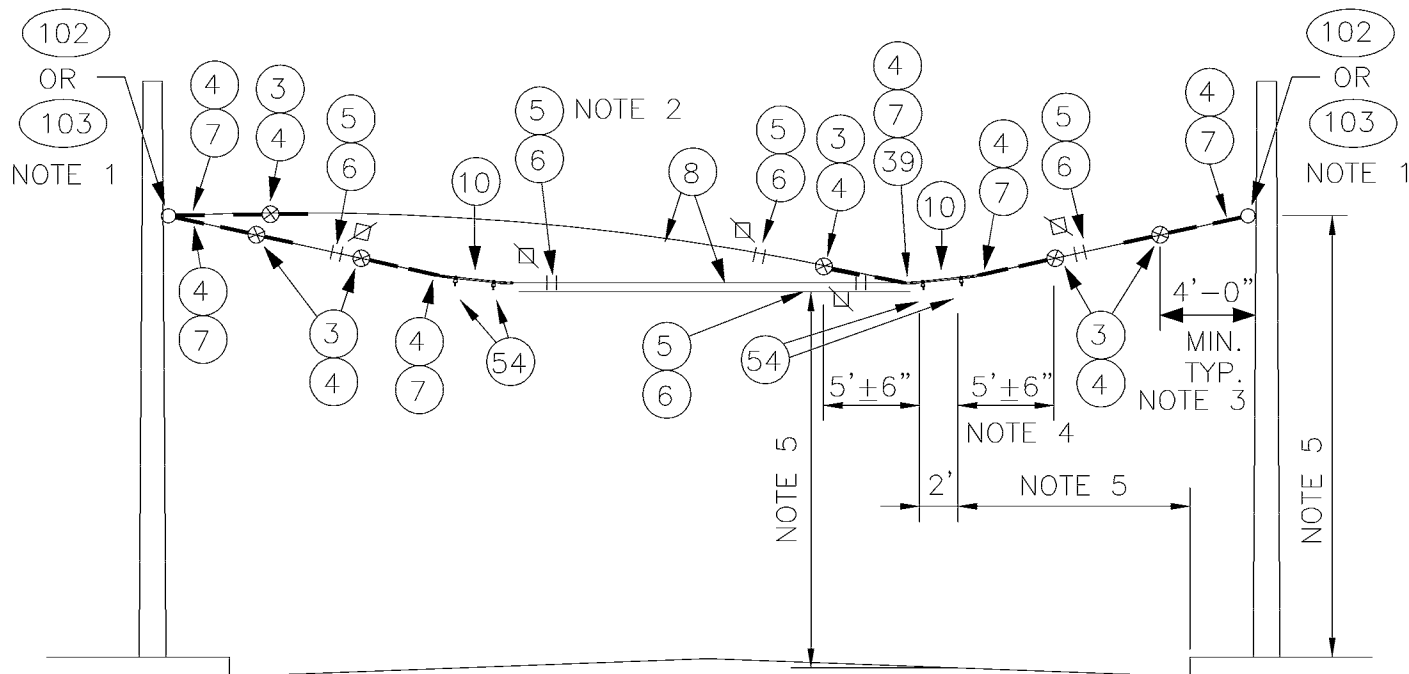
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	VARIES	DETROIT CLAMP ASSY	WABCO	19293-3007
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	8	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	2	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
53	VARIES	CURVE RAIL (3° TO 5° 2 FT LG)	K & M	851 B412/0
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS 1° TO 5° CURVE SPAN WITH TWO FOOT CURVE RAILS TWO-WAY TRAFFIC	DATE: APR 96
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-307
APPROVED				SHT 2 OF 2



PLAN



ELEVATION

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⏏". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. ANGLE VARIES FROM 5.5° TO 7.5°.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES. SEE SA-167 FOR INSULATED GUY CRITERIA.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

5.5° TO 7.5 ° CURVE SPAN
WITH 4 FOOT CURVE RAILS
TWO-WAY TRAFFIC

DATE:
JUN 95

FILE

DWG. NO.
SA-308

SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	6	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	15	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	10	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	6	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	2	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
39	1	5/8" SHACKLE	WABCO	13722-2000
54	VARIES	CURVE RAIL (5.5° TO 7.5° 4 FT LG) K & M	851	B412/1
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

5.5° TO 7.5° CURVE SPAN
WITH 4 FOOT CURVE RAILS
TWO-WAY TRAFFIC

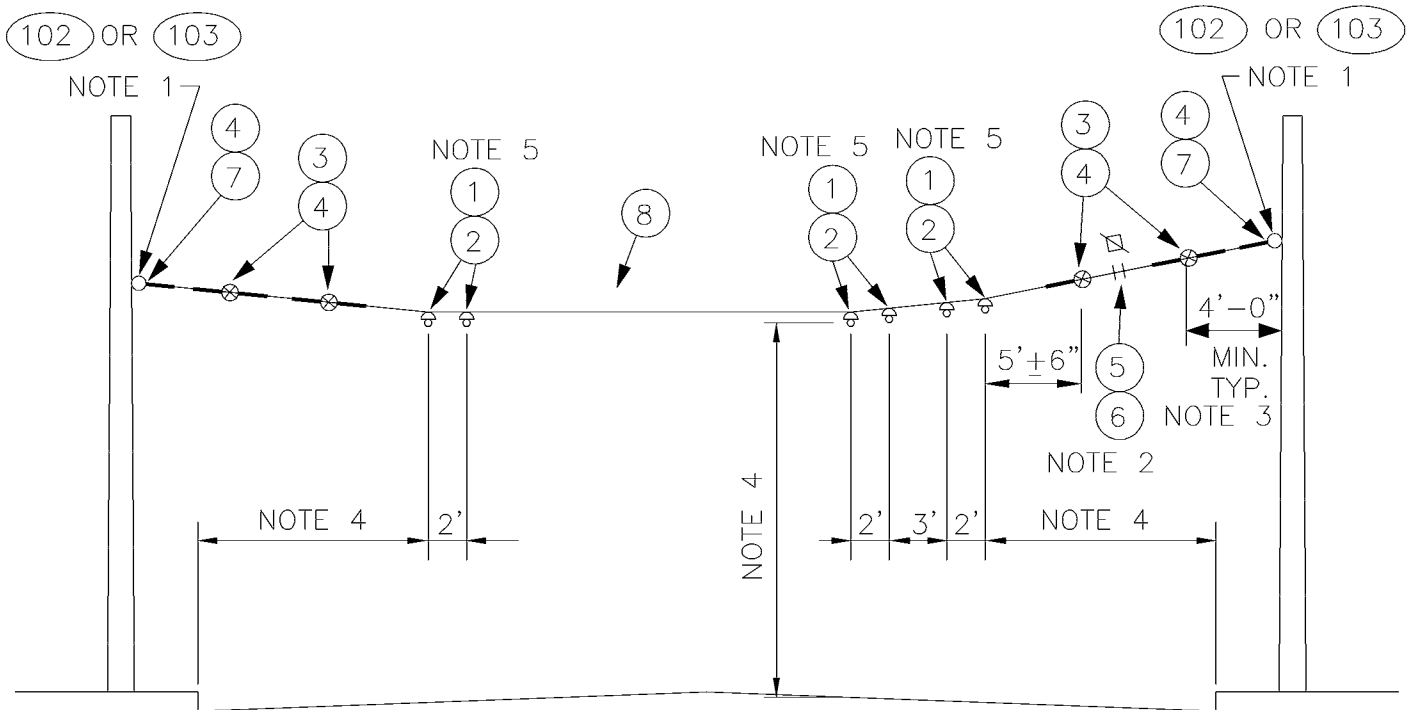
DATE:
OCT 95

FILE

DWG. NO.

SA-308

SHT 2 OF 2



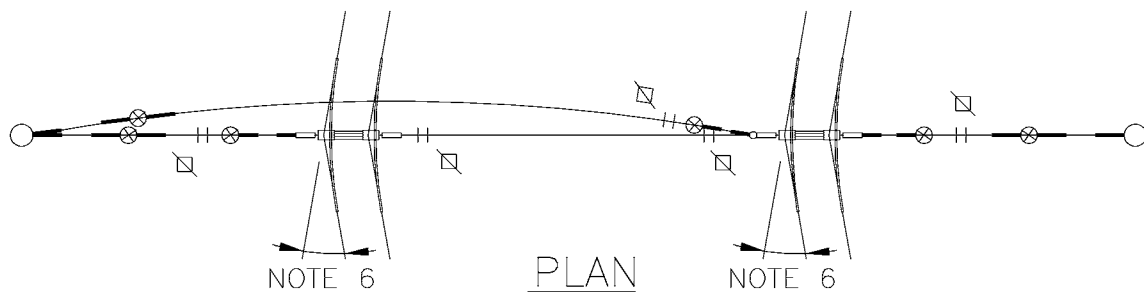
NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⊠". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. MAXIMUM ANGLE IS 0.5°. SEE SA-307, PLAN VIEW.

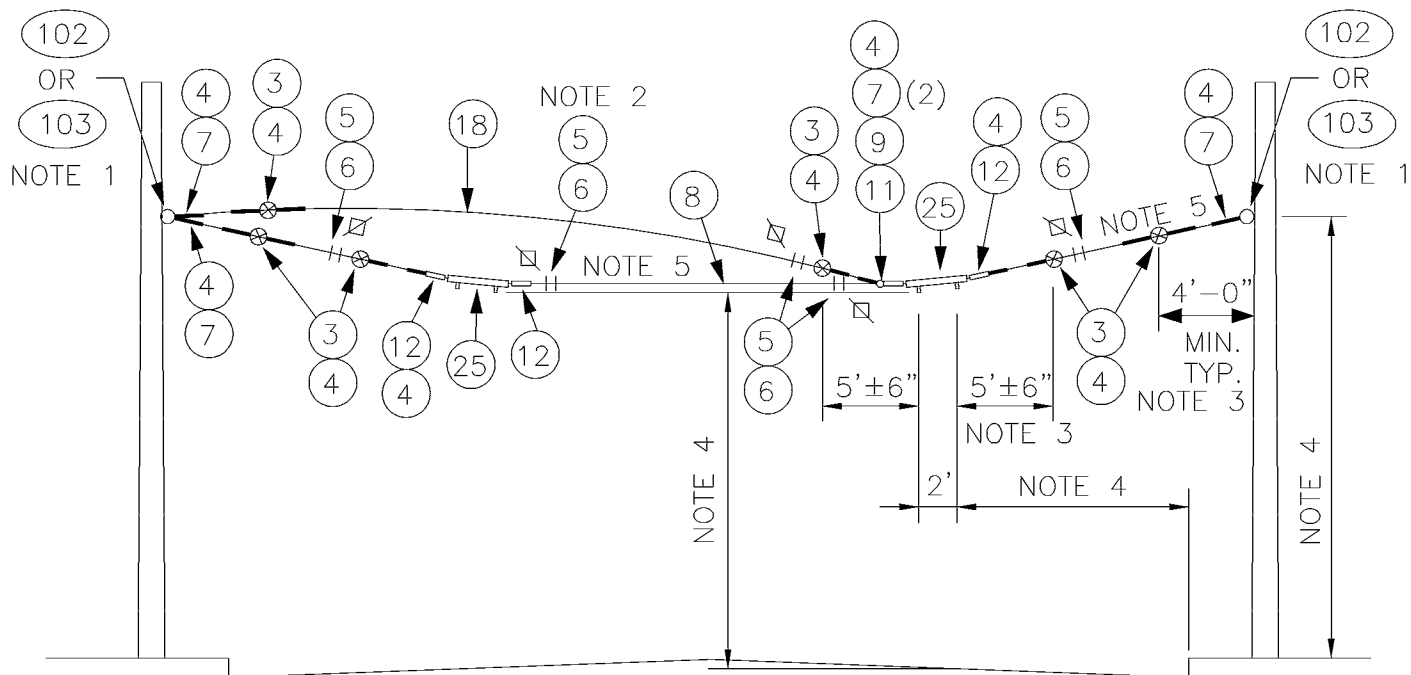
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	6	DETROIT CLAMP ASSY	WABCO	19293-3007
02	6	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	9	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: TMB	SCALE: NONE		TANGENT SPAN THREE TRACKS	FILE
RECOM.	CONTRACT:			DWG. NO. SA-309
APPROVED				SHT 1 OF 1



PLAN



ELEVATION

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌵". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-371 FOR LIMITED SPACE VARIANCES. SEE SA-167 FOR INSULATED GUY CRITERIA.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. INSIDE PULLOFF MAY NOT BE REQUIRED, SEE DRAWINGS FOR EACH INSTALLATION.
6. ANGLE VARIES FROM 8° TO 30°.

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

8° TO 30° CURVE SPAN
WITH CURVE SEGMENTS
TWO-WAY TRAFFIC

DATE:
OCT 95

FILE

DWG. NO.

SA-310

SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	6	GUY STRAIN INSUL	PORCELAIN	504
04	15	GUY GRIP DEADEND	PRODUCTS CO	CDE-3106
05	10	WIRE ROPE CLIP, 5/16"	PREFORMED	G450
06	AS	FRICTION TAPE, 3/4" (6 WRAPS)	CROSBY	
07	REQD	THIMBLE, 3/8" XHD, OPEN		
08	5	GUY STRAND	CROSBY	G414
09	VARIES	BULL RING	COPPERWELD	8M
12	VARIES	BULL RING	WABCO	18567-2000
12	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
18	1	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
25	3	GUY STRAND, COVERED	WABCO	
	VARIES	CURVE SEGMENT 8-12 DEG TYPE C	COPPERWELD	8M
	VARIES	CURVE SEGMENT 13-27 DEG TYPE C	WABCO	22301-3014
	VARIES	CURVE SEGMENT 28-47 DEG TYPE C	WABCO	22302-3005
	SEE	CURVE SEGMENT 28-47 DEG TYPE C	WABCO	22303-3005
102	PLAN	FORGED THREE-PIECE ADJUSTABLE POLE	KORTICK	
	VARIES	BAND, ANNEALED & GALVANIZED	MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:

TMB

RECOM.

APPROVED

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

8° TO 30° CURVE SPAN
WITH CURVE SEGMENTS
TWO-WAY TRAFFIC

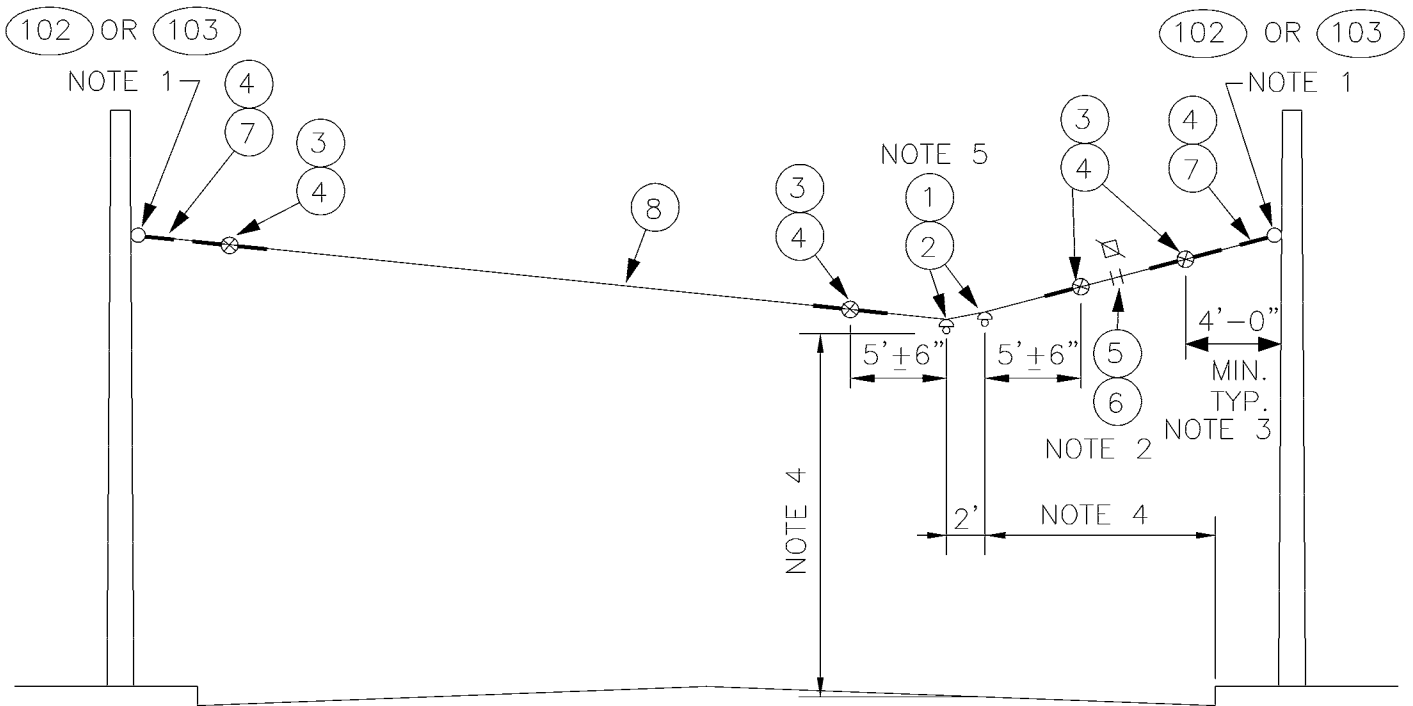
DATE:
OCT 95

FILE

DWG. NO.

SA-310

SHT 2 OF 2



NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. MAXIMUM ANGLE IS 0.5°. SEE SA-317 PLAN VIEW.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
02	2	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	9	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	10	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

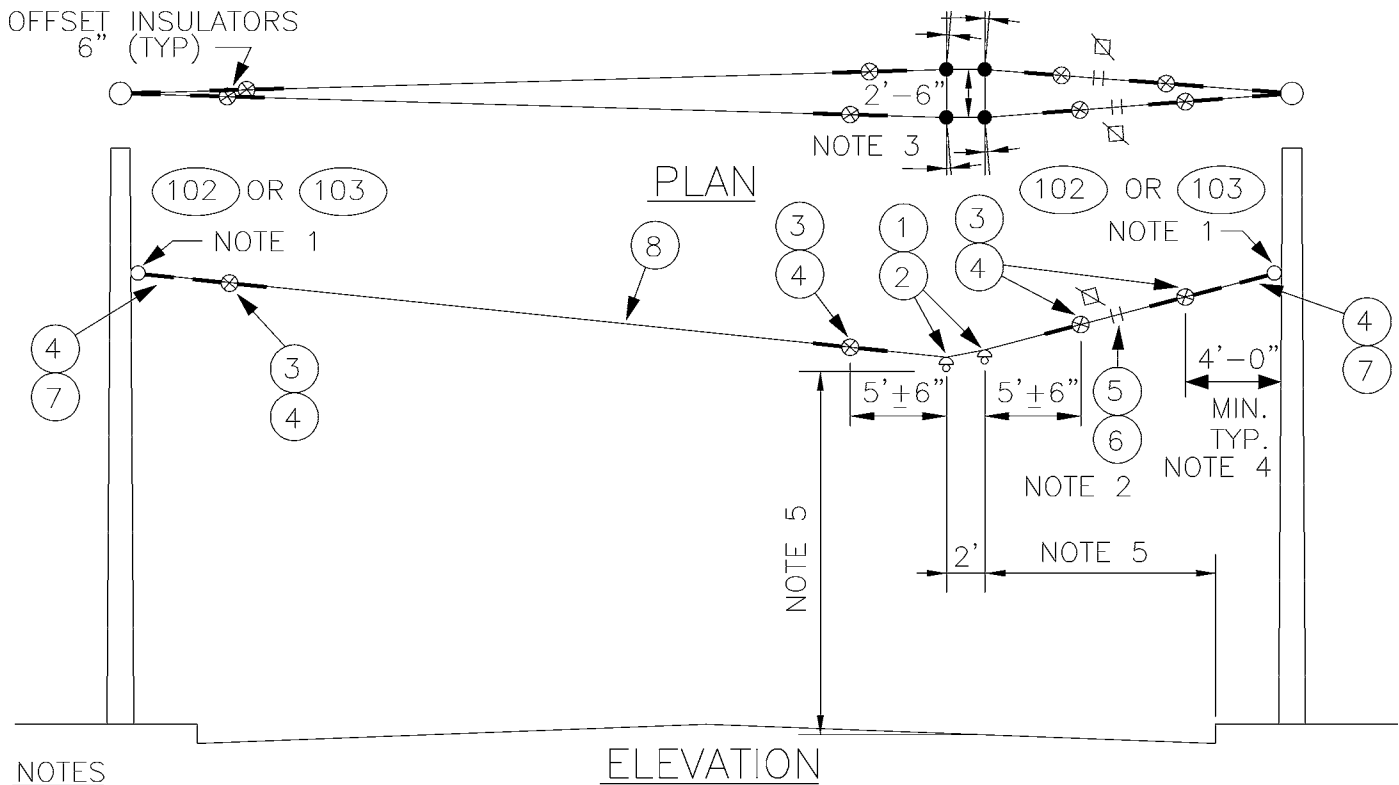
TANGENT SPAN
ONE-WAY TRAFFIC

DATE:
OCT 95

FILE

DWG. NO.
SA-311

SHT 1 OF 1



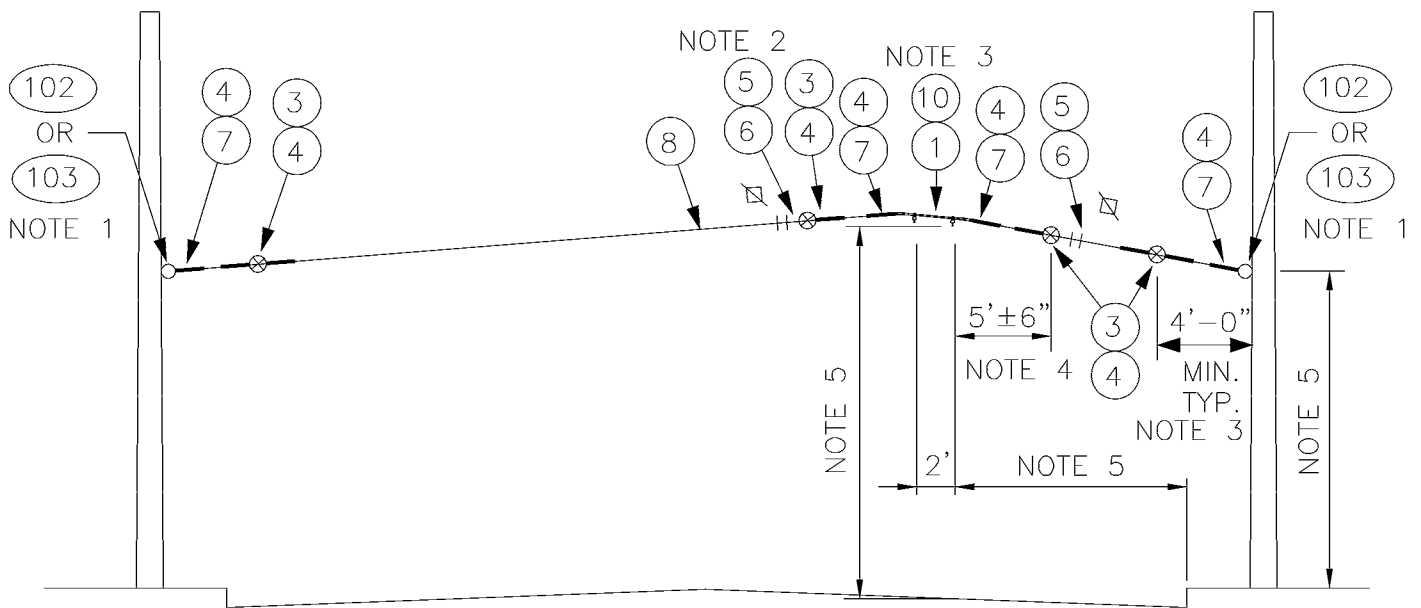
- NOTES**
1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
 2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
 3. MAXIMUM ANGLE 1°, 0.5° PER SPAN HANGER.
 4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
 5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
02	4	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	8	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	18	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS HOLDUP TANGENT SPAN ONE-WAY TRAFFIC	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-312
APPROVED				SHT 1 OF 1

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NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌵". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. MAXIMUM ANGLE 0.5°. SEE SA-317, PLAN VIEW.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

INVERTED TANGENT SPAN
ONE-WAY TRAFFIC

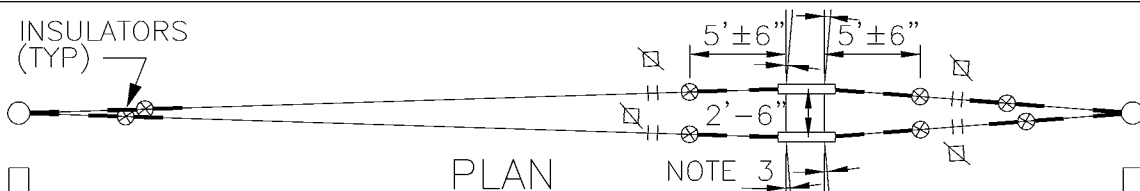
DATE:
OCT 95

FILE

DWG. NO.
SA-313

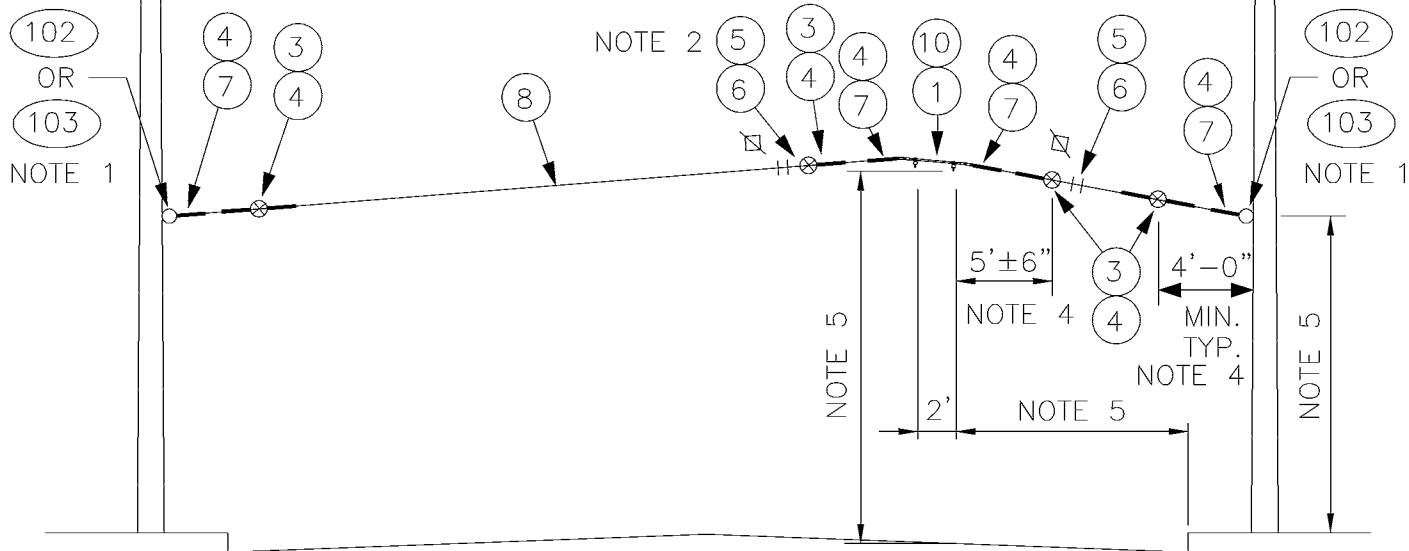
SHT 1 OF 1

OFFSET 6" (TYP)



PLAN

NOTE 3



NOTES

ELEVATION

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. MAXIMUM ANGLE 1 DEGREE, 0.5° PER DOUBLE CURVE HANGER.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
03	8	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	20	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	8	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	8	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	2	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG
DR: TMB
RECOM.
APPROVED

CHKD: DOW
SCALE: NONE
CONTRACT:



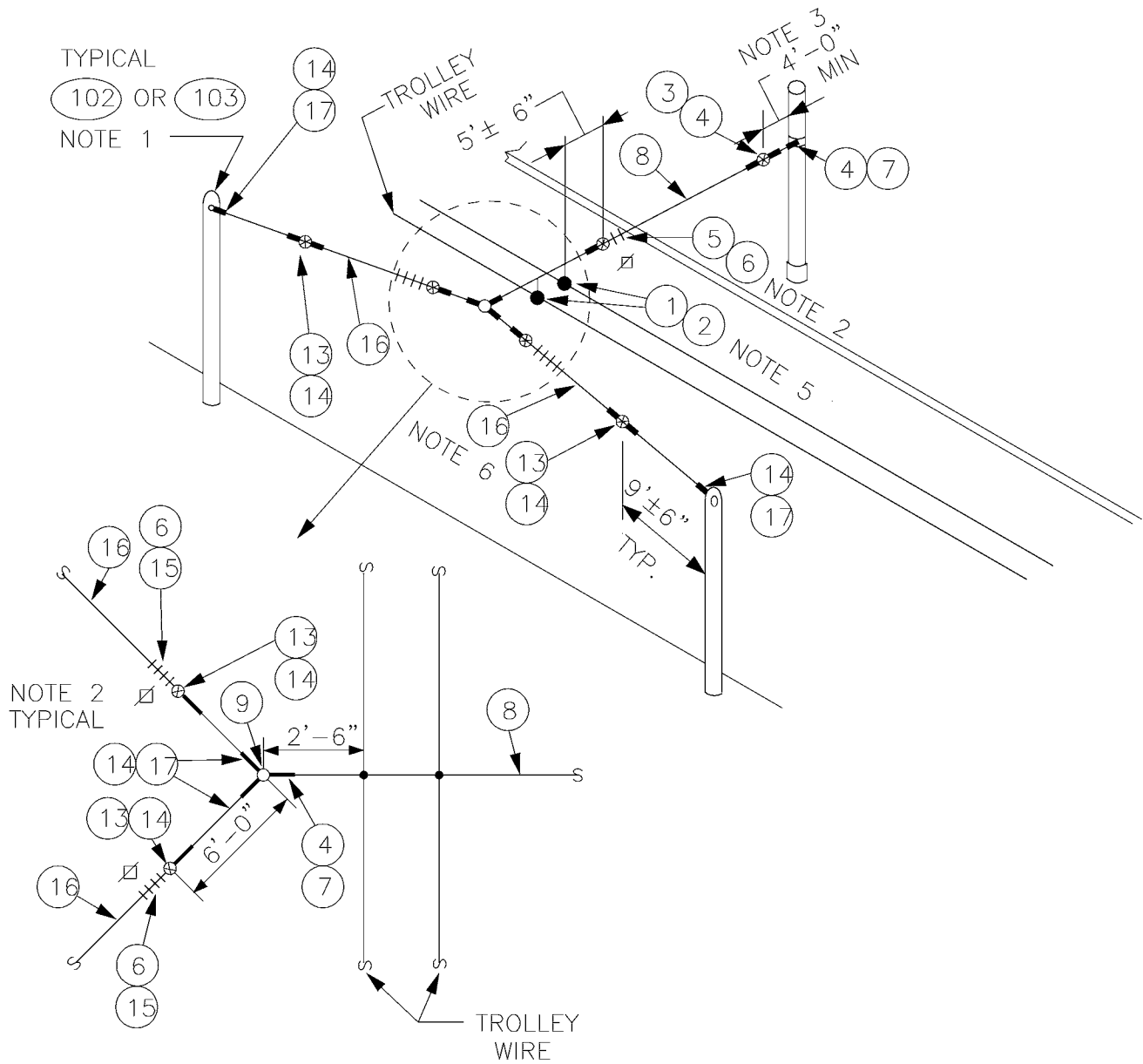
King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

HOLDDOWN TANGENT SPAN
ONE-WAY TRAFFIC

DATE: OCT 95
FILE
DWG. NO. SA-314
SHT 1 OF 1

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DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

BRIDLE TANGENT SPAN
ONE-WAY TRAFFIC

DATE:
JUN 95

FILE

DWG. NO.

SA-315

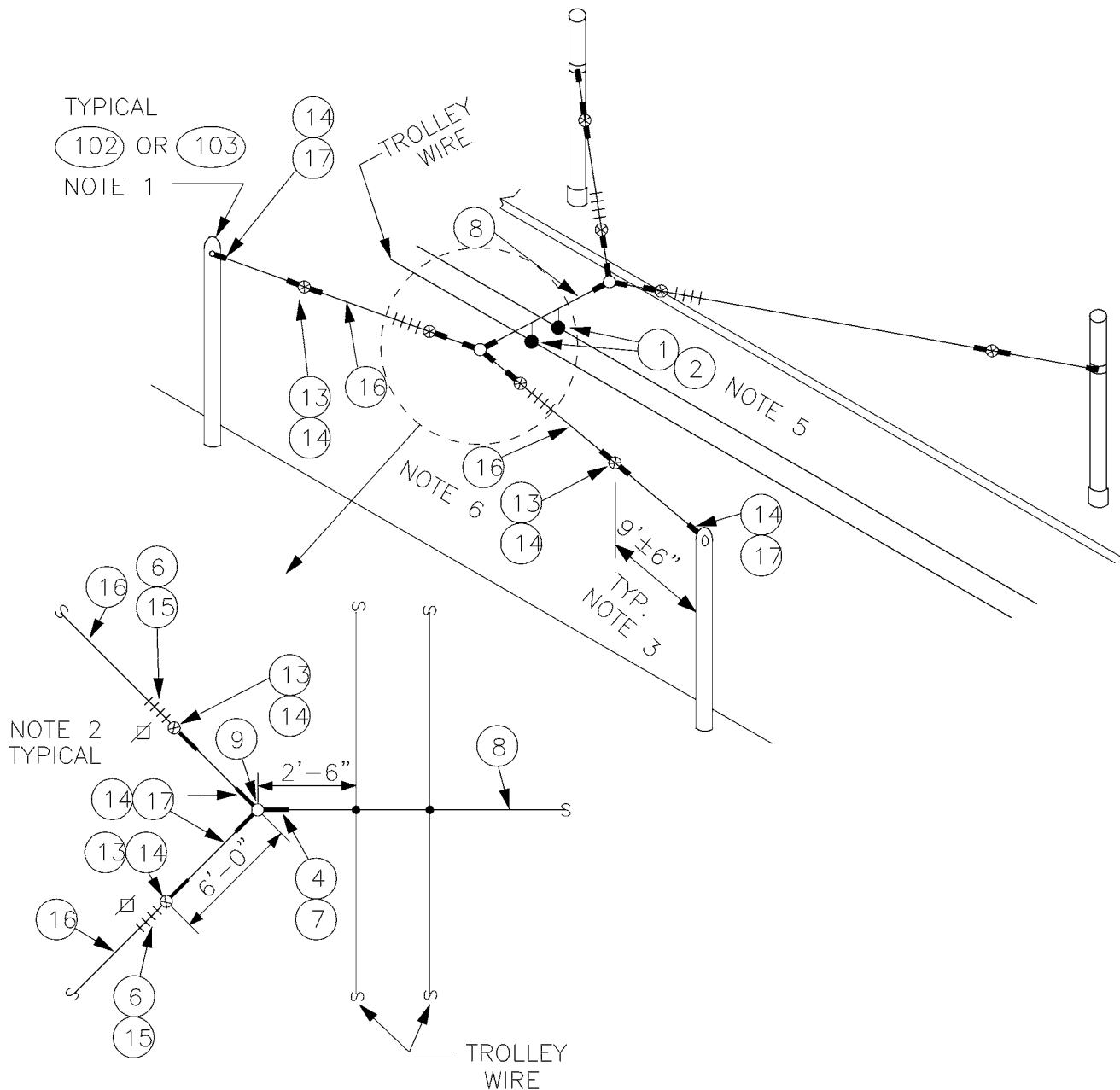
SHT 1 OF 2

MATERIAL LIST				
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
02	2	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	VARIES	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	1	BULL RING	WABCO	18567-2000
13	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	VARIES	WIRE ROPE CLIP, 3/8"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M
17	VARIES	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. MAXIMUM ANGLE IS 0.5°. SEE SA-307, PLAN VIEW.
6. IF LOAD SHOWN ON OVERHEAD DRAWINGS IS LESS THAN 2500 LBS, THEN ITEM 8 MAY BE USED INSTEAD OF ITEM 16. THE ASSOCIATED ITEMS SHALL ALSO BE CHANGED I.E. 3 FOR 13, 4 FOR 14, 5 FOR 15 AND 7 FOR 17.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS BRIDLE TANGENT SPAN ONE-WAY TRAFFIC	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-315
APPROVED				SHT 2 OF 2



DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:		DOUBLE BRIDGE TANGENT SPAN ONE-WAY TRAFFIC	DWG. NO. SA-316
APPROVED				SHT 1 OF 2

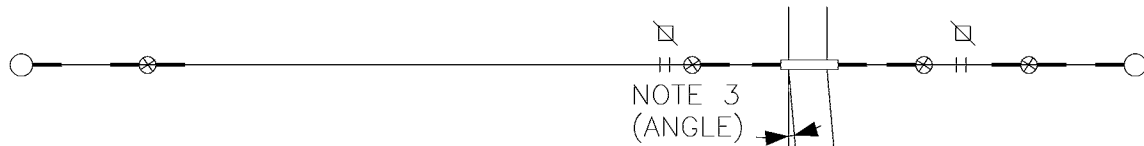
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
02	2	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	VARIES	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	2	BULL RING	WABCO	18567-2000
13	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	VARIES	WIRE ROPE CLIP, 3/8"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M
17	VARIES	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

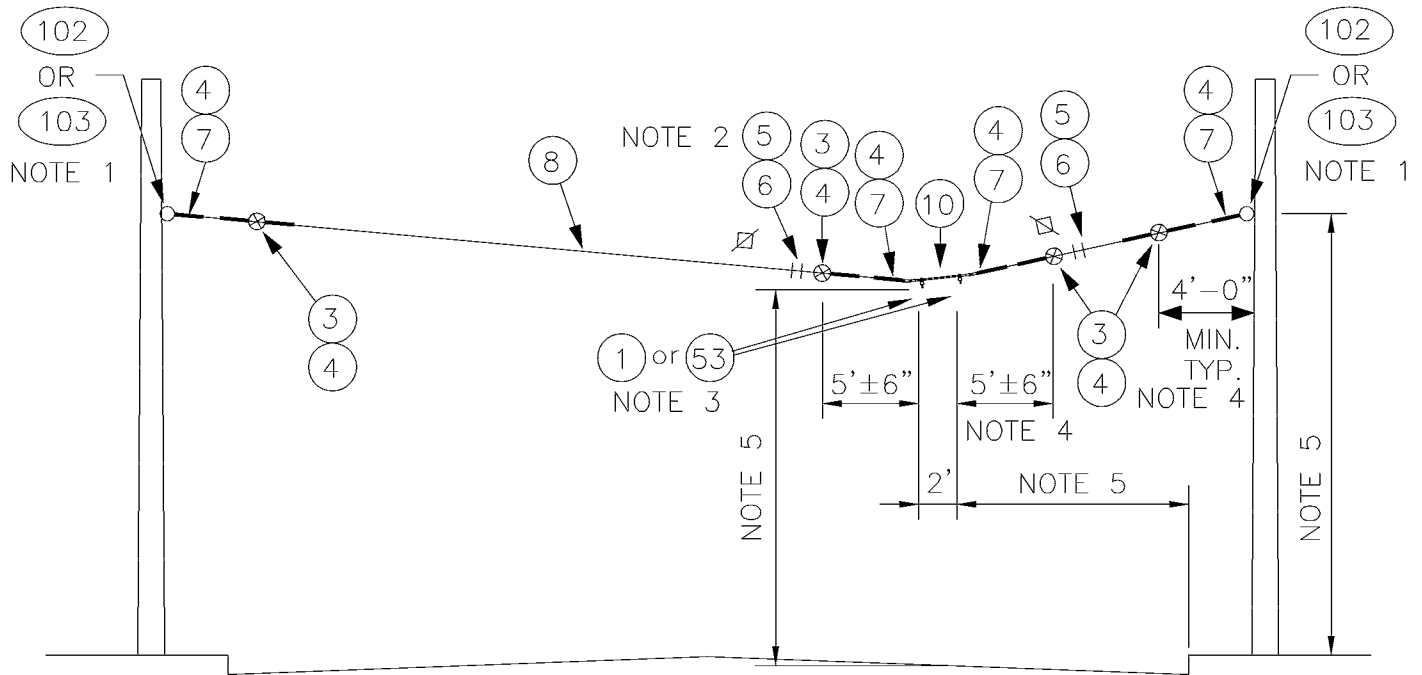
NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. MAXIMUM ANGLE IS 0.5°. SEE SA-307, PLAN VIEW.
6. IF LOAD SHOWN ON OVERHEAD DRAWINGS IS LESS THAN 2500 LBS, THEN ITEM 8 MAY BE USED INSTEAD OF ITEM 16. THE ASSOCIATED ITEMS SHALL ALSO BE CHANGED I.E. 3 FOR 13, 4 FOR 14, 5 FOR 15 AND 7 FOR 17.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DOUBLE BRIDLE TANGENT SPAN ONE-WAY TRAFFIC	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-316
APPROVED				SHT 2 OF 2



PLAN



ELEVATION

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌘". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. ANGLE VARIES FROM 1° TO 5°. USE ITEM 1 FOR 1° TO 2.5° ANGLE. USE ITEM 53 FOR 3° TO 5° ANGLE.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS 1° TO 5° CURVE SPAN WITH 2 FOOT CURVE RAILS ONE-WAY TRAFFIC	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-317
APPROVED				SHT 1 OF 2

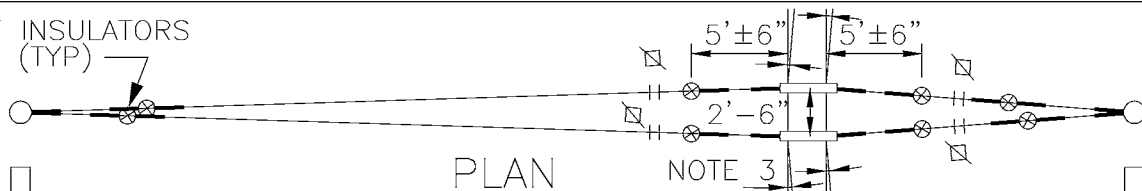
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	VARIES	DETROIT CLAMP ASSY	WABCO	19293-3007
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
53	VARIES	CURVE RAIL (1° TO 5° 2 FT LG)	K & M	851 B412/0
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

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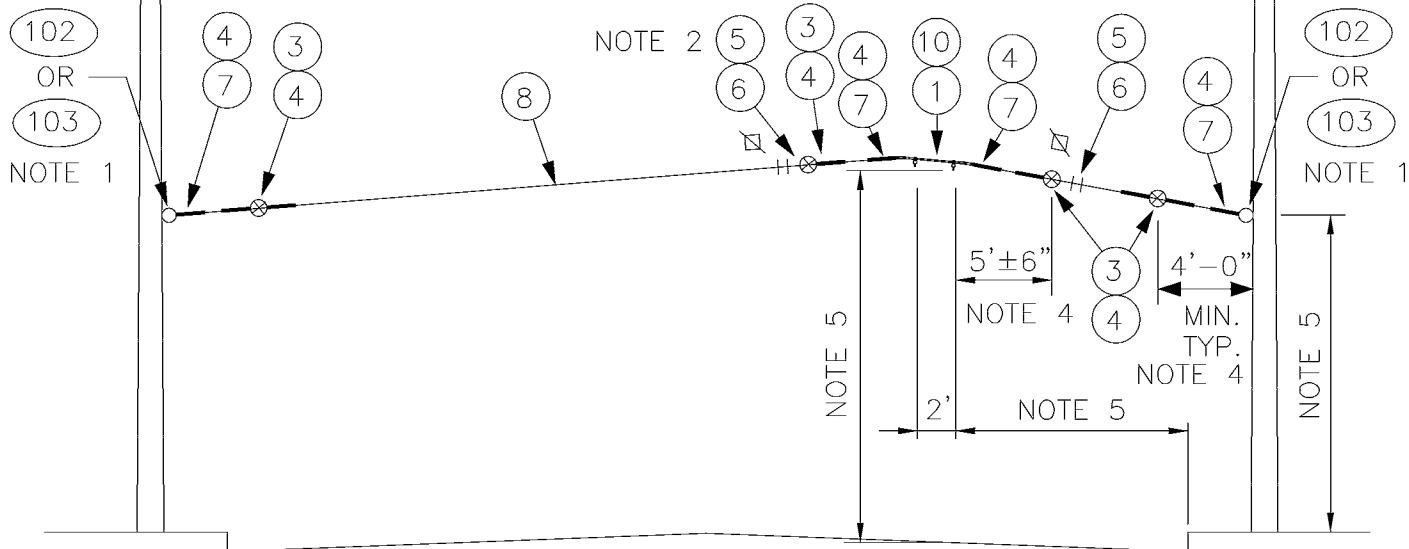
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS 1° TO 5° CURVE SPAN WITH 2 FOOT CURVE RAILS ONE-WAY TRAFFIC	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-317
APPROVED				SHT 2 OF 2

OFFSET
6" (TYP)



PLAN

NOTE 3



NOTES

ELEVATION

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "□". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. MAXIMUM ANGLE 1 DEGREE, 0.5° PER DOUBLE CURVE HANGER.
4. SEE SA-370 FOR LIMITED SPACE VARIANCES.
5. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
03	8	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	20	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	8	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	8	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	2	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

5.5° TO 7.5° CURVE SPAN
WITH 4 FOOT CURVE RAILS
ONE-WAY TRAFFIC

DATE:

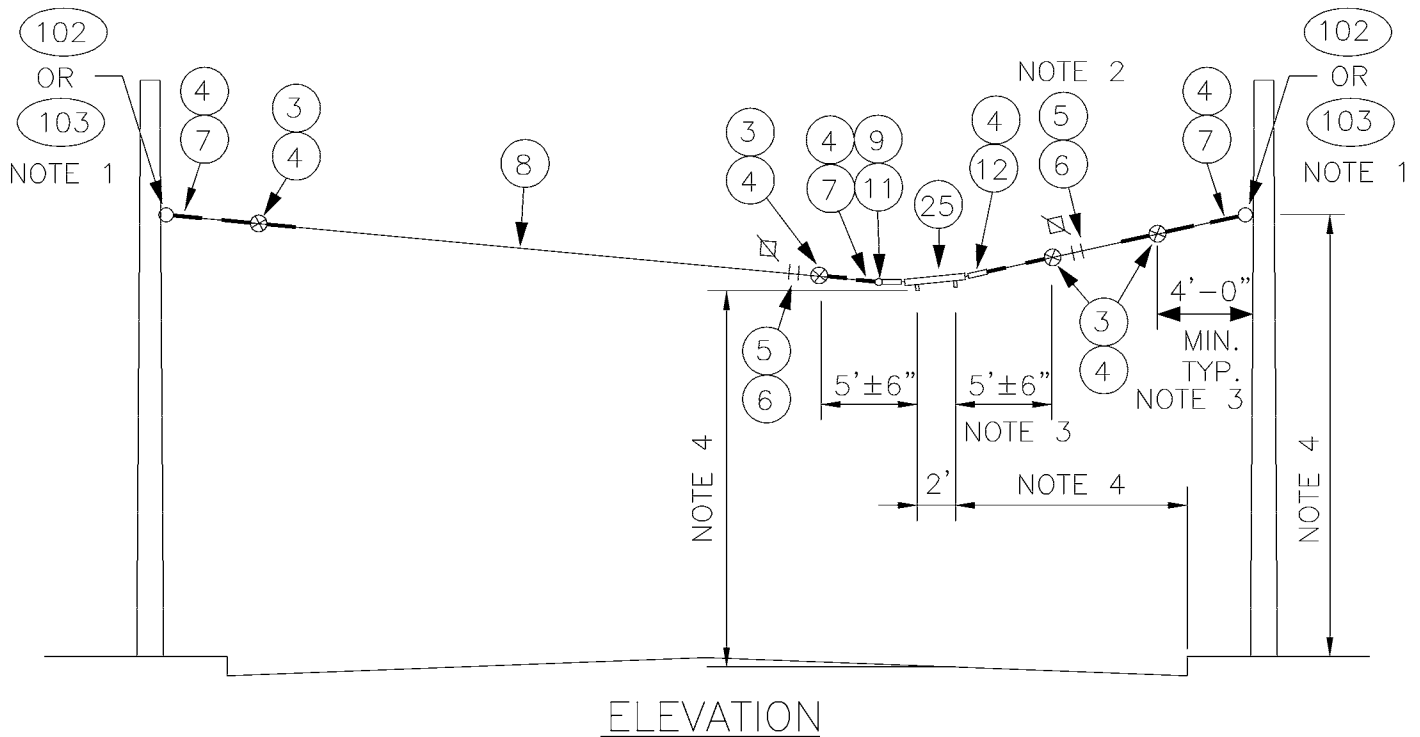
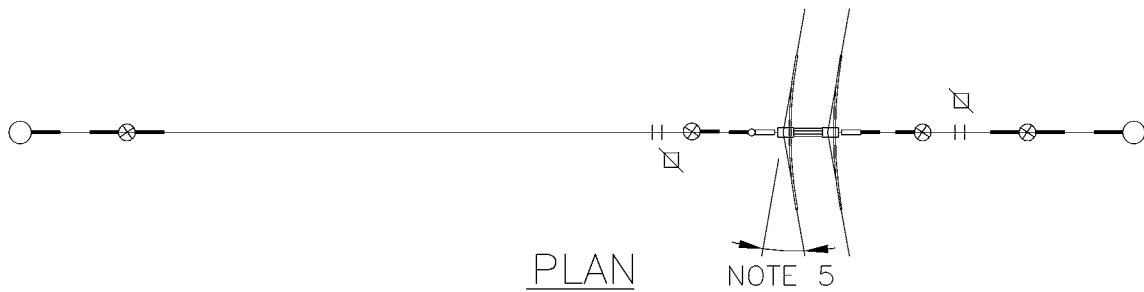
OCT 95

FILE

DWG. NO.

SA-318

SHT 1 OF 1



NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌘". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.
5. ANGLE VARIES FROM 8° TO 30°.

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

8° TO 30° CURVE SPAN
WITH CURVE SEGMENT
ONE-WAY TRAFFIC

DATE:
OCT 95

FILE

DWG. NO.

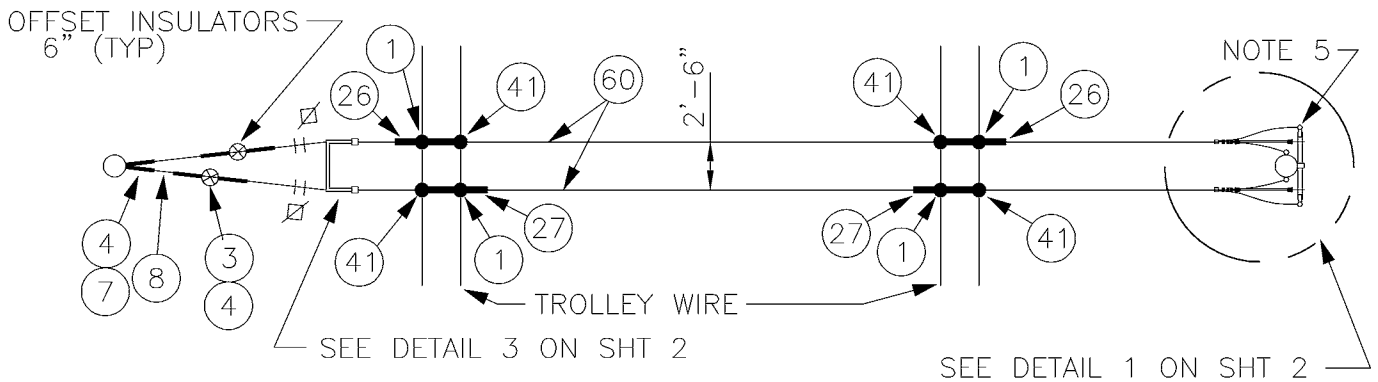
SA-320

SHT 1 OF 2

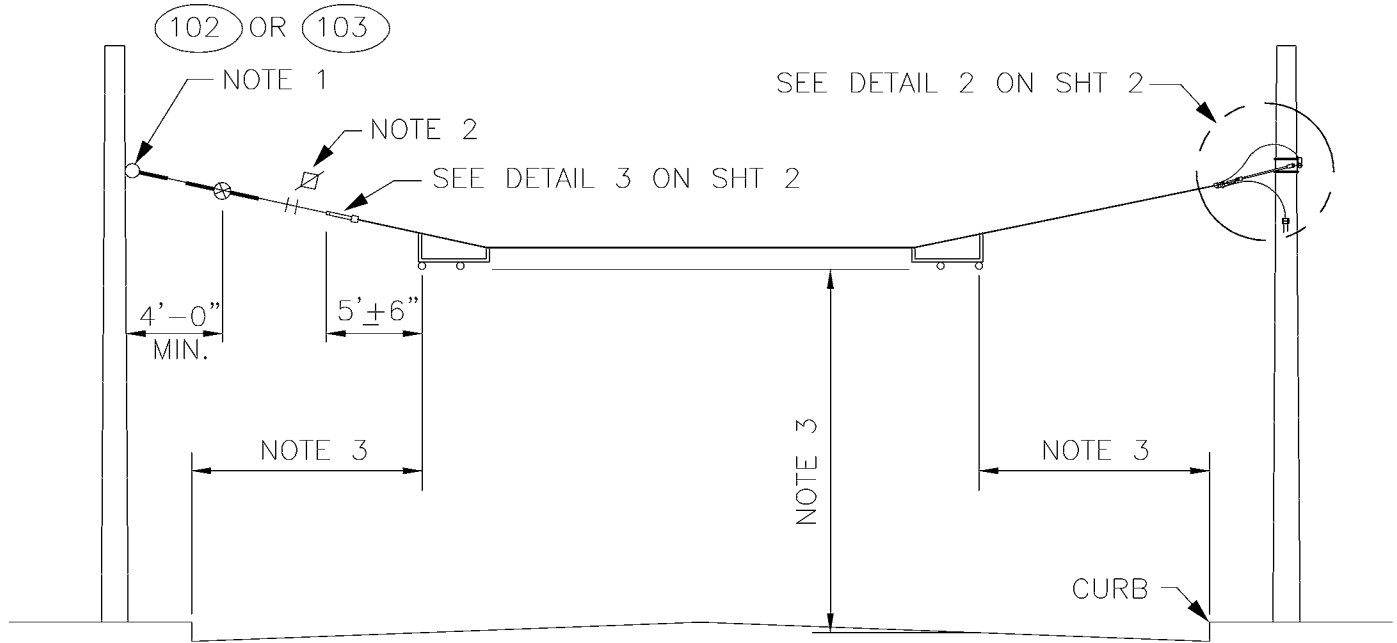
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
12	2	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
25	VARIES (SEE PLAN)	CURVE SEGMENT 8-12 DEG TYPE C CURVE SEGMENT 13-27 DEG TYPE C CURVE SEGMENT 28-47 DEG TYPE C	WABCO WABCO WABCO	22301-3014 22302-3005 22303-3005
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS 8° TO 30° CURVE SPAN WITH CURVE SEGMENT ONE-WAY TRAFFIC	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-320
APPROVED				SHT 2 OF 2




PLAN

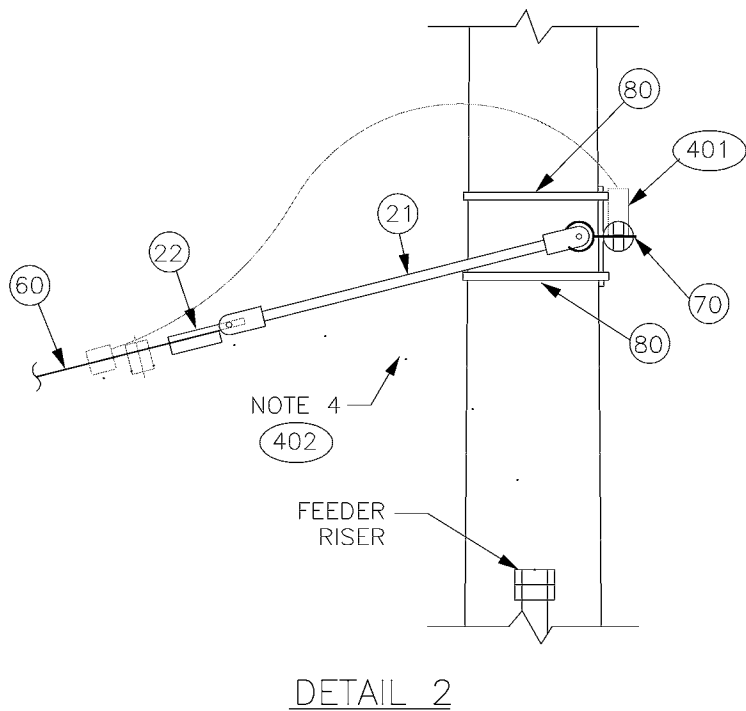
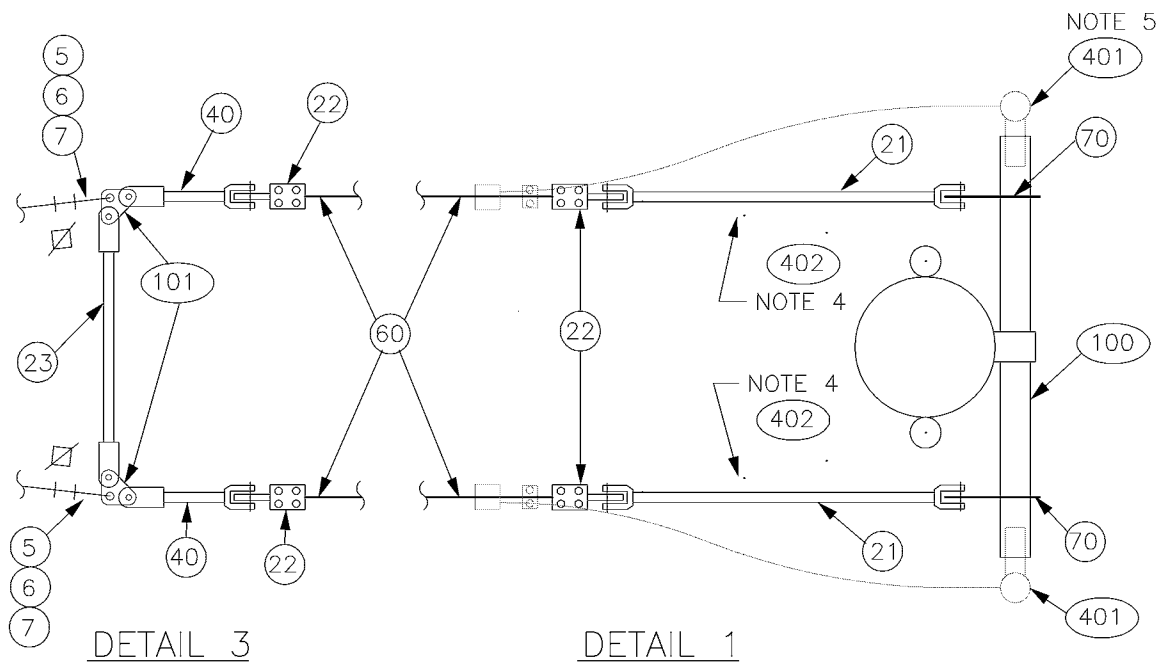


ELEVATION

NOTES:

1. A POLE COLLAR, OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "∇". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. CONNECT FEEDER RISER TO FEED SPAN. SEE SA-402.
5. INSTALL LIGHTNING ARRESTERS PER SA-401.


DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DOUBLE FEEDER SPAN TWO-WAY TRAFFIC	DATE: OCT 95
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-321
APPROVED				SHT 1 OF 3

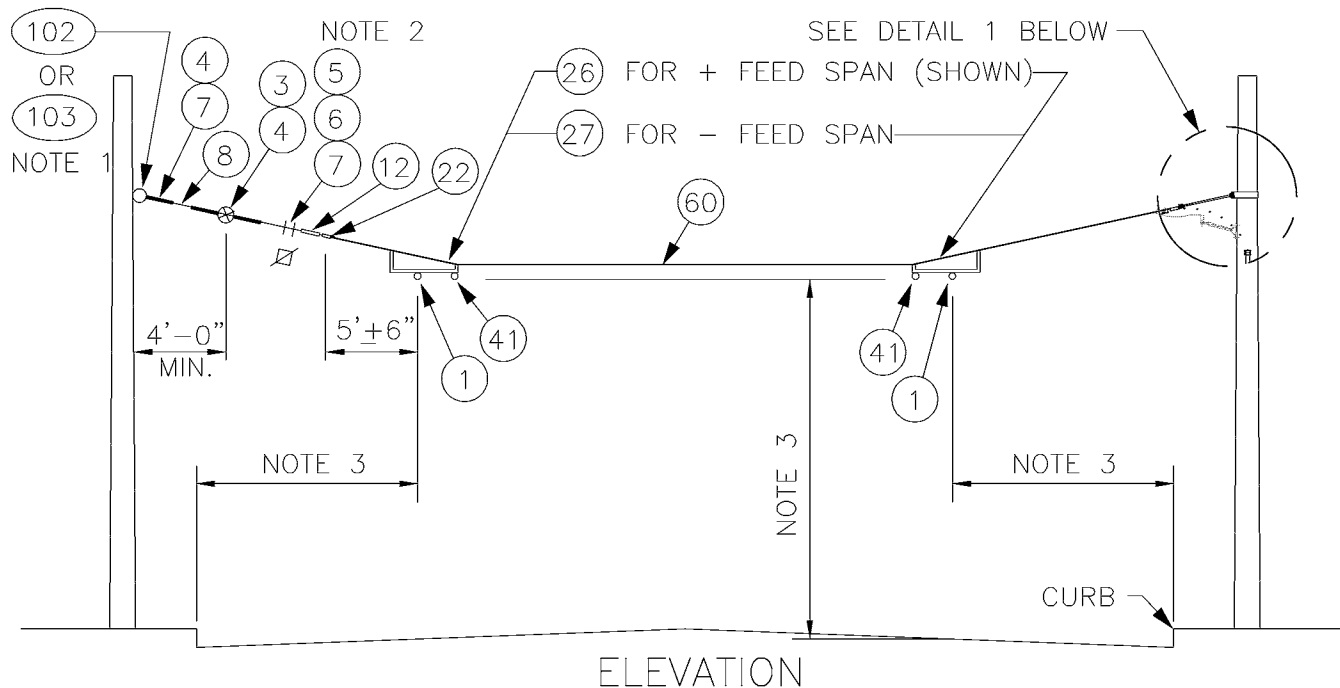


DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DOUBLE FEEDER SPAN TWO-WAY TRAFFIC	DATE: JUN 95
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-321
APPROVED				SHT 2 OF 3

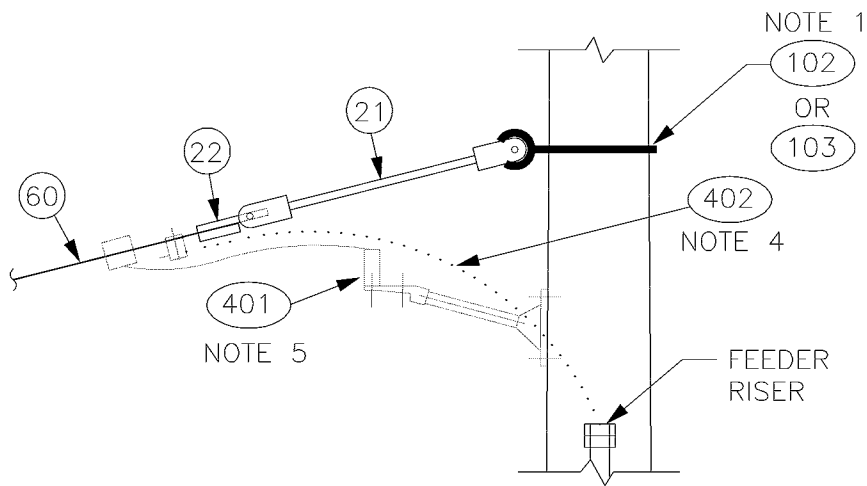
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	6	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
21	2	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6360
22	4	CLAMP STRAIN EYE	WABCO	10571-2000
23	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6260
26	2	TYPE PH-4 POS FEED SPAN HANGER	WABCO	54937-3002
27	2	TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54936-3002
40	2	7/8 TRANSLITE STRAIN INSUL CL-90	WABCO	54995-6120
41	4	H.S.P. FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UN-SHIELDED, 5 KV EPR W/ PVC JACKET		
70	2	EYEBOLT, 5/8" X 6" W/2 NUTS & LOCKWASHER		
80	AS REQD	3/4" X 0.030" SS BANDING TYPE 201	BAND-IT	C206
100	VARIES	EPOXIROD DEADEND ARM	CHANCE	C653-1023
101	2	STRAIN PLATE	METRO STD	SA-101
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103
401	AS REQD	LIGHTNING ARRESTER	METRO STD	SA-401
402	AS REQD	FEEDER RISER	METRO STD	SA-402

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DOUBLE FEEDER SPAN TWO-WAY TRAFFIC	DATE: OCT 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-321
APPROVED				SHT 3 OF 3



ELEVATION



DETAIL 1

NOTES:

1. A POLE COLLAR, OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌵". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. CONNECT FEEDER RISER TO FEED SPAN. SEE SA-402.
5. INSTALL LIGHTNING ARRESTERS PER SA-401.

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SINGLE FEEDER SPAN
TWO-WAY TRAFFIC

DATE:
OCT 95

FILE

DWG. NO.
SA-322

SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO	504
04	3	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
12	3	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
21	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6360
22	2	CLAMP STRAIN EYE	WABCO	10571-2000
26	2/0	TYPE PH-4 POS FEED SPAN HANGER	WABCO	54937-3002
27	0/2	TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54936-3002
41	2	H.S.P. FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UNSHIELDED 5 KV EPR W/ PVC JACKET		
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103
401	AS REQD	LIGHTNING ARRESTER	METRO STD	SA-401
402	AS REQD	FEEDER RISER	METRO STD	SA-402

DESIGNED
DPG

CHKD:
DPG

DR:
DOW

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SINGLE FEEDER SPAN
TWO-WAY TRAFFIC

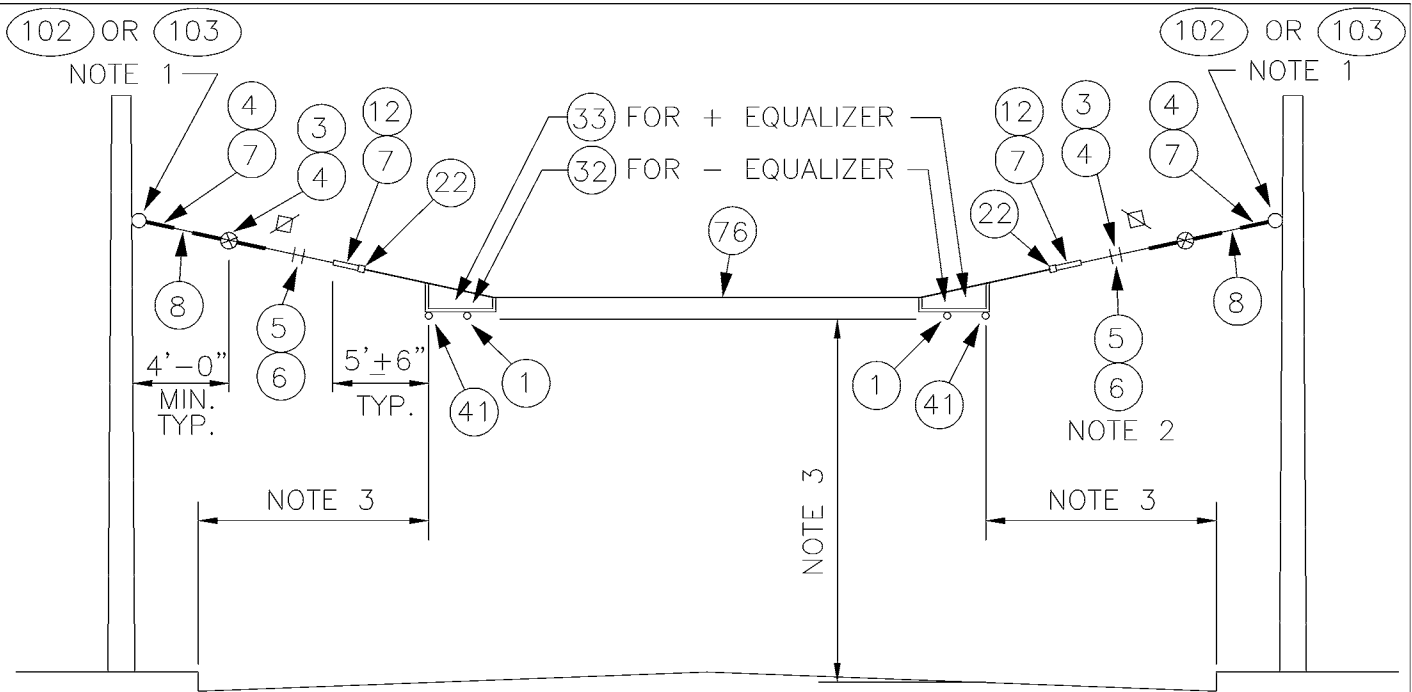
DATE:
OCT 95

FILE

DWG. NO.

SA-322

SHT 2 OF 2



NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌵". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO	504
04	6	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
12	2	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
22	2	CLAMP STRAIN EYE	WABCO	10571-2000
32	2/0	TYPE PH-4 POS FEED SPAN HANGER	WABCO	54936-3001
33	0/2	TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54937-3001
41	2	HSP FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
76	AS REQD	4/0 STRANDED INSUL CABLE		
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

EQUALIZER SPAN
TWO-WAY TRAFFIC

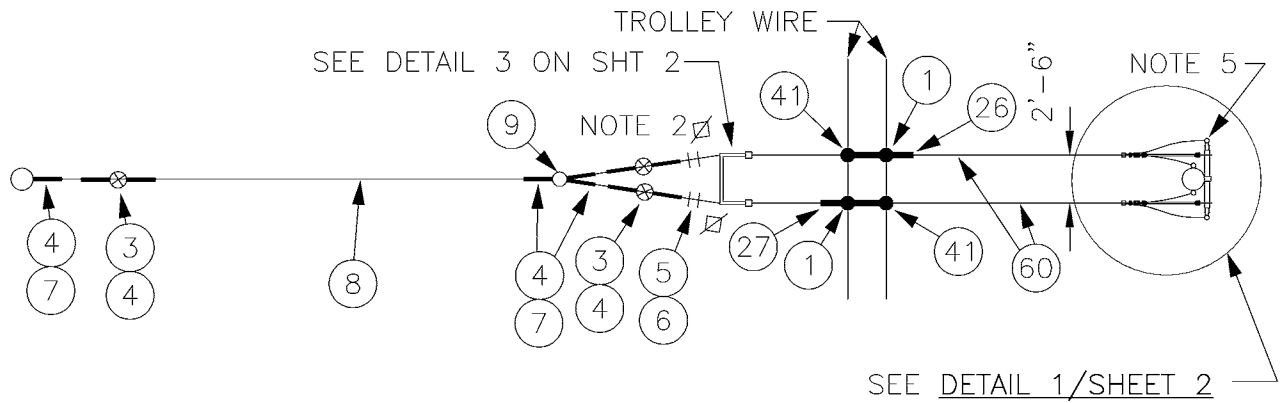
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MAY 97

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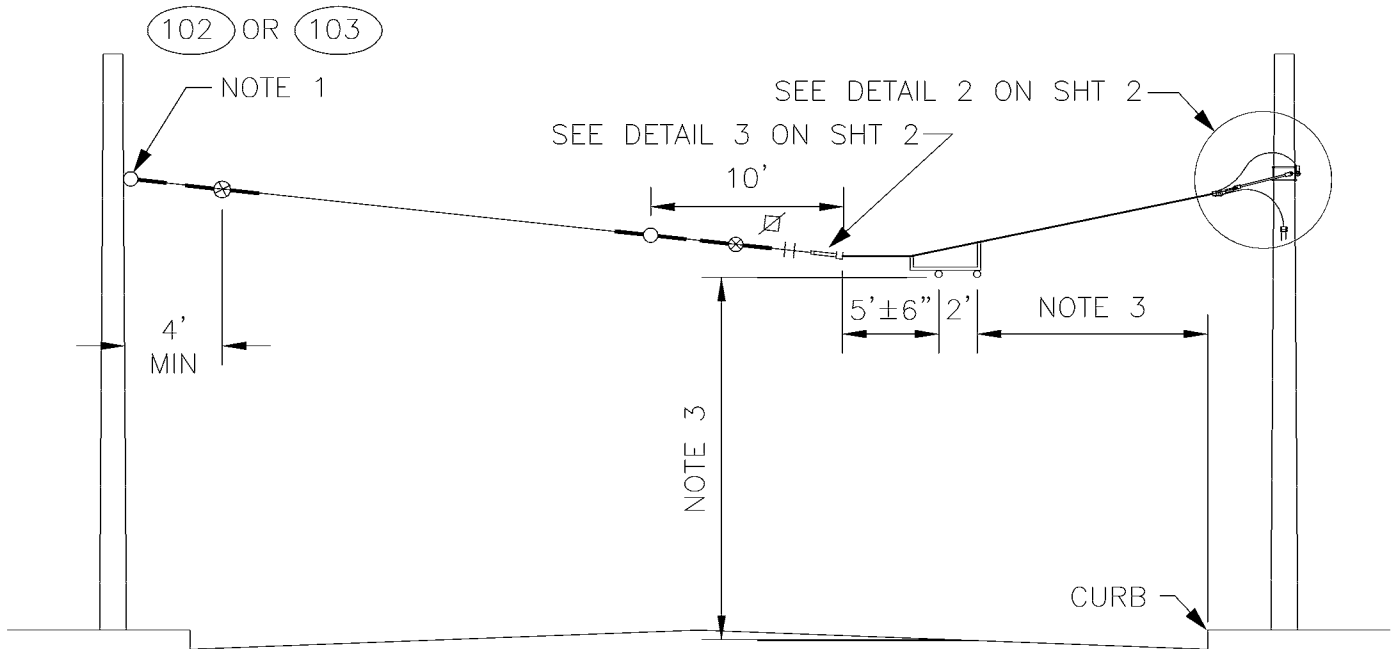
DWG. NO.

SA-325

SHT 1 OF 1



PLAN



ELEVATION

NOTES:

1. A POLE COLLAR, OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⚡". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. CONNECT FEEDER RISER TO FEED SPAN. SEE SA-402.
5. INSTALL LIGHTNING ARRESTERS PER SA-401.

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

DOUBLE FEEDER SPAN
ONE-WAY TRAFFIC

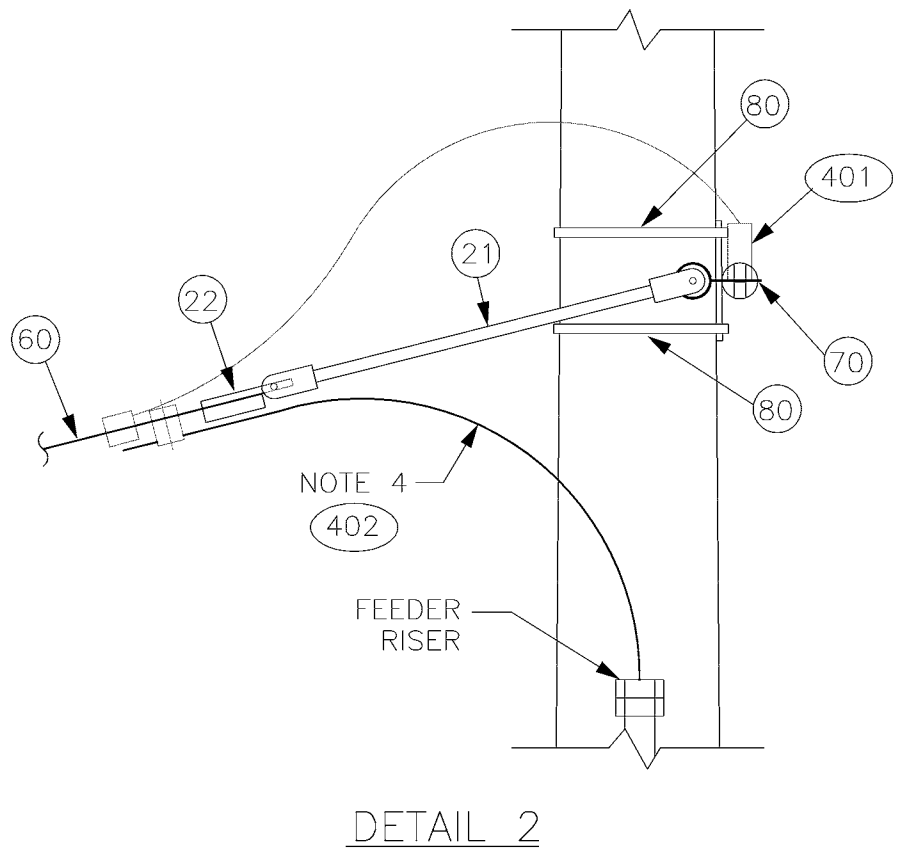
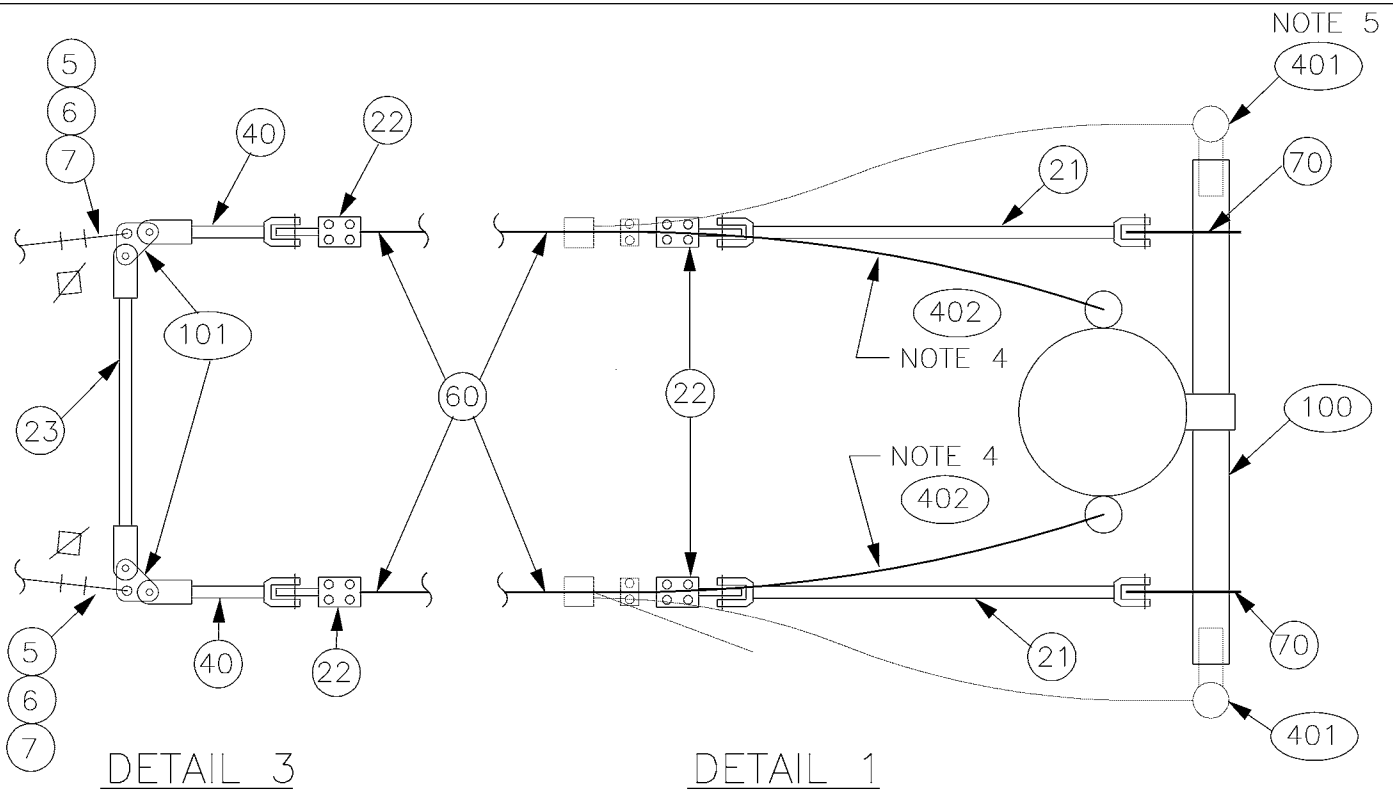
DATE:
OCT 95

FILE


DWG. NO.

SA-331

SHT 1 OF 3



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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DOUBLE FEEDER SPAN ONE-WAY TRAFFIC	DATE: JUN 95
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-331
APPROVED				SHT 2 OF 3

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
03	3	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	6	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	1	BULL RING	WABCO	18567-2000
21	2	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6360
22	4	CLAMP STRAIN EYE	WABCO	10571-2000
23	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6260
26	1	TYPE PH-4 POS FEED SPAN HANGER	WABCO	54937-3002
27	1	TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54936-3002
40	2	7/8 TRANSLITE STRAIN INSUL CL-90	WABCO	54995-6120
41	2	H.S.P. FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UNSHIELDED, 5KV EPR W/ PVC JACKET		
70	2	EYEBOLT, 5/8" x 6", WITH 2 NUTS & LOCKWASHER		
80	AS REQD	3/4" x 0.03" SS BANDING TYPE 201	BAND-IT	C206
100	VARIES	EPOXIROD DEADEND ARM	CHANCE	C653-1023
101	2	STRAIN PLATE	METRO STD	SA-101
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103
401	AS REQD	LIGHTNING ARRESTER	METRO STD	SA-401
402	AS REQD	FEEDER RISER	METRO STD	SA-402

DESIGNED
DPG

DR:
DOW

RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

DOUBLE FEEDER SPAN
ONE-WAY TRAFFIC

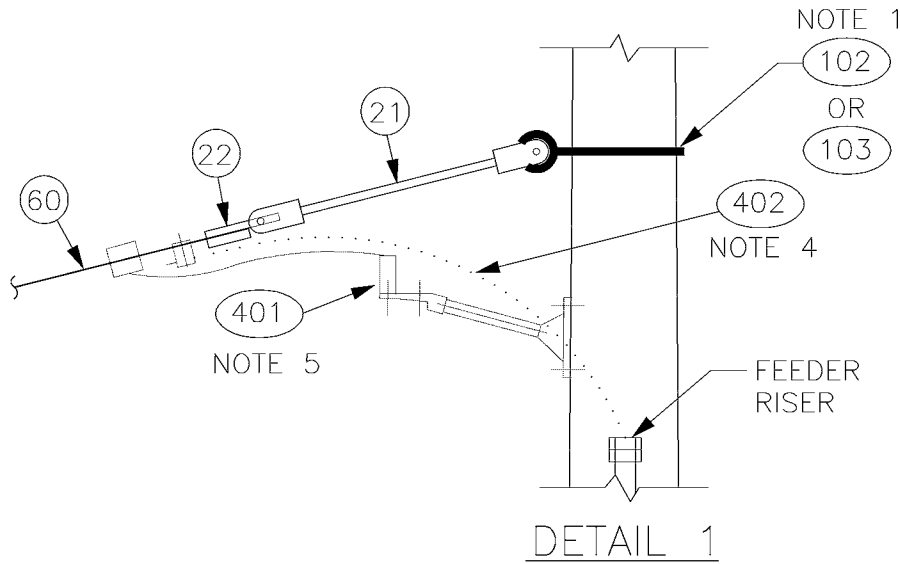
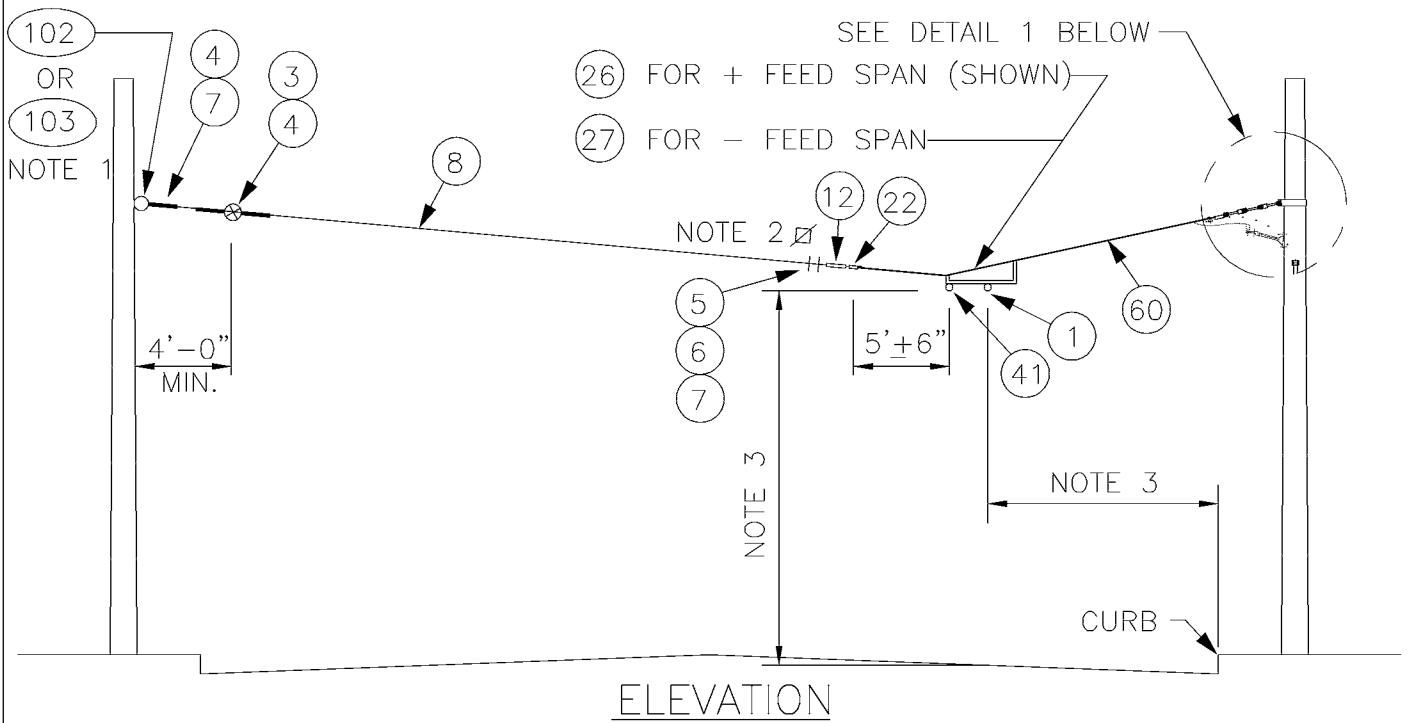
DATE:
OCT 95

FILE

DWG. NO.

SA-331

SHT 3 OF 3



NOTES:

1. A POLE COLLAR, OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⚡". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. CONNECT FEEDER RISER TO FEED SPAN. SEE SA-402.
5. INSTALL LIGHTNING ARRESTERS PER SA-401.

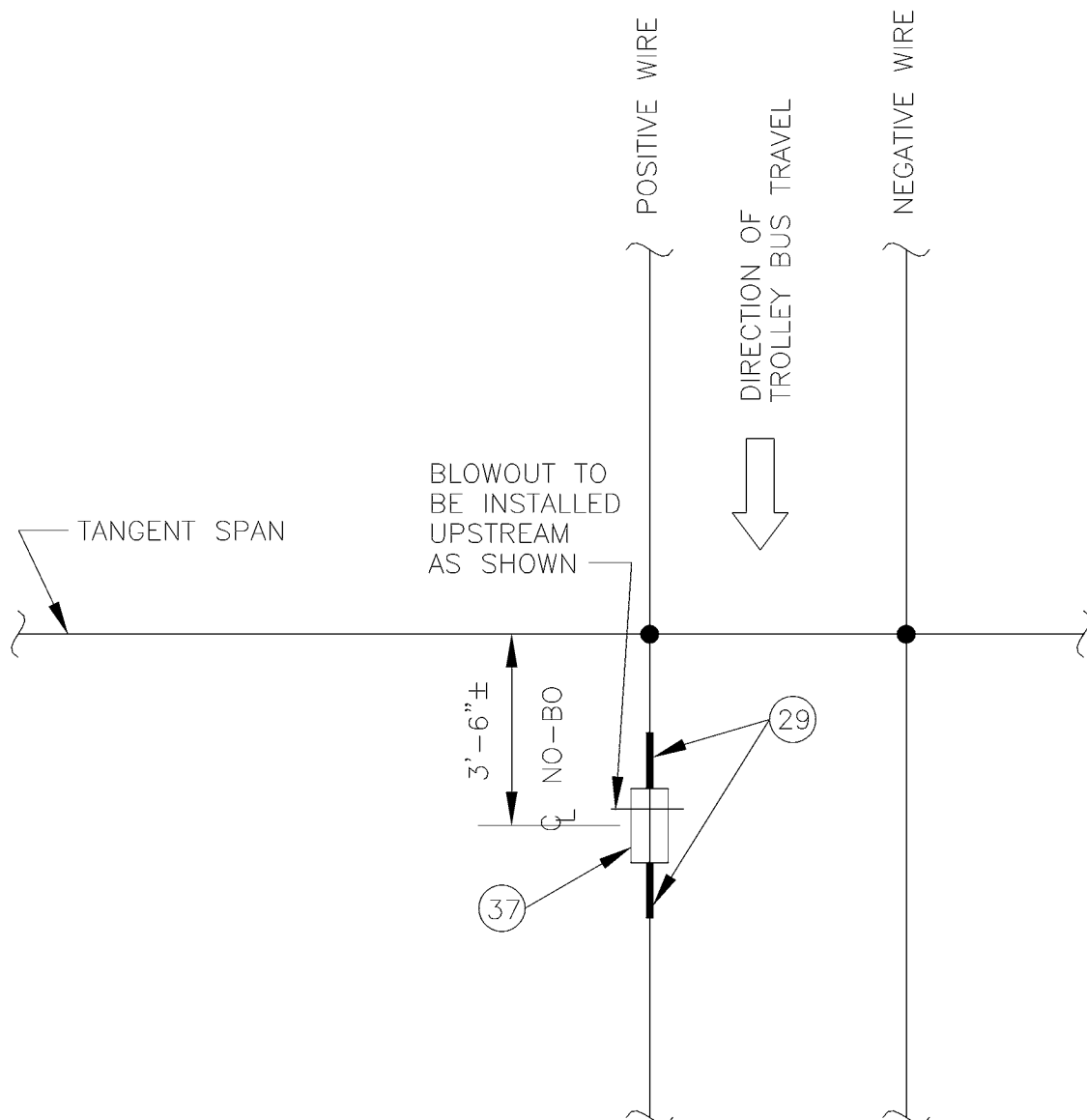
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: MM	SCALE: NONE		SINGLE FEEDER SPAN ONE-WAY TRAFFIC	FILE
RECOM.	CONTRACT:			DWG. NO. SA-332
APPROVED				SHT 1 OF 2

3. INSTALL LIGHTNING ARRESTERS PER SA-401.
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	1	DETROIT CLAMP ASSY	WABCO	19293-3007
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	3	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
12	1	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
21	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6360
22	2	CLAMP STRAIN EYE	WABCO	10571-2000
26	1/0	TYPE PH-4 POS FEED SPAN HANGER	WABCO	54937-3002
27	0/1	TYPE PH-5 NEG FEED SPAN HANGER	WABCO	54936-3002
41	1	H.S.P. FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UNSHIELDED, 5KV EPR W/ PVC JACKET		
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103
401	AS REQD	LIGHTNING ARRESTER	METRO STD	SA-401
402	AS REQD	FEEDER RISER	METRO STD	SA-402

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DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: OCT 95
DR: DOW	SCALE: NONE		SINGLE FEEDER SPAN ONE-WAY TRAFFIC	FILE
RECOM.	CONTRACT:			DWG. NO. SA-332
APPROVED				SHT 2 OF 2

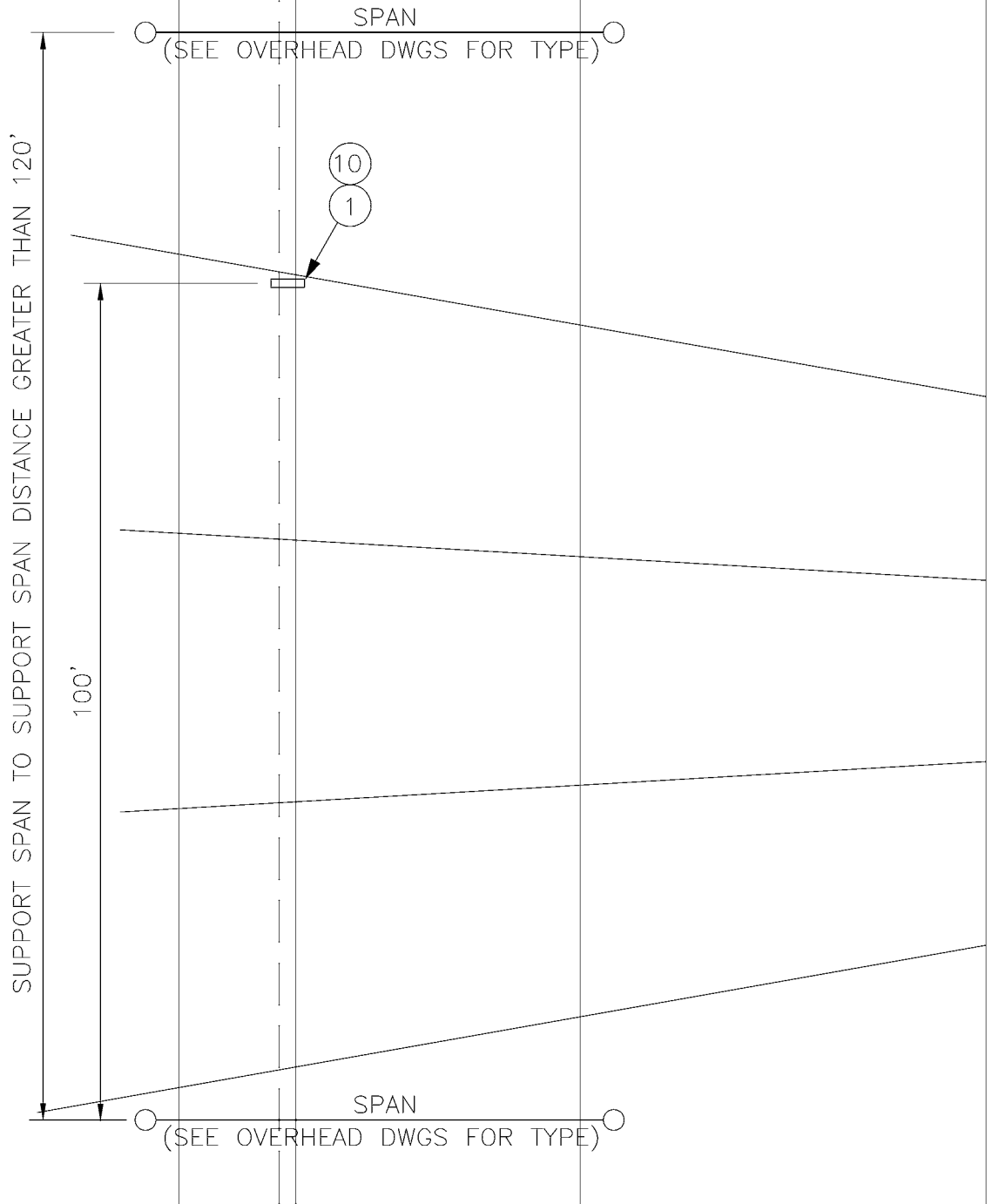


PLAN

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
29	2	TYPE TCL CLEVIS TIP 4/0	WABCO	54950-3002
37	1	NO-BO SECTION INSUL	WABCO	55025-3001

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SECTIONALIZING SPAN ONE-WAY TRAFFIC	DATE: JUN 93
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-333
APPROVED				SHT 1 OF 1



MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001

DESIGNED
DPG

DR:
DOW

RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

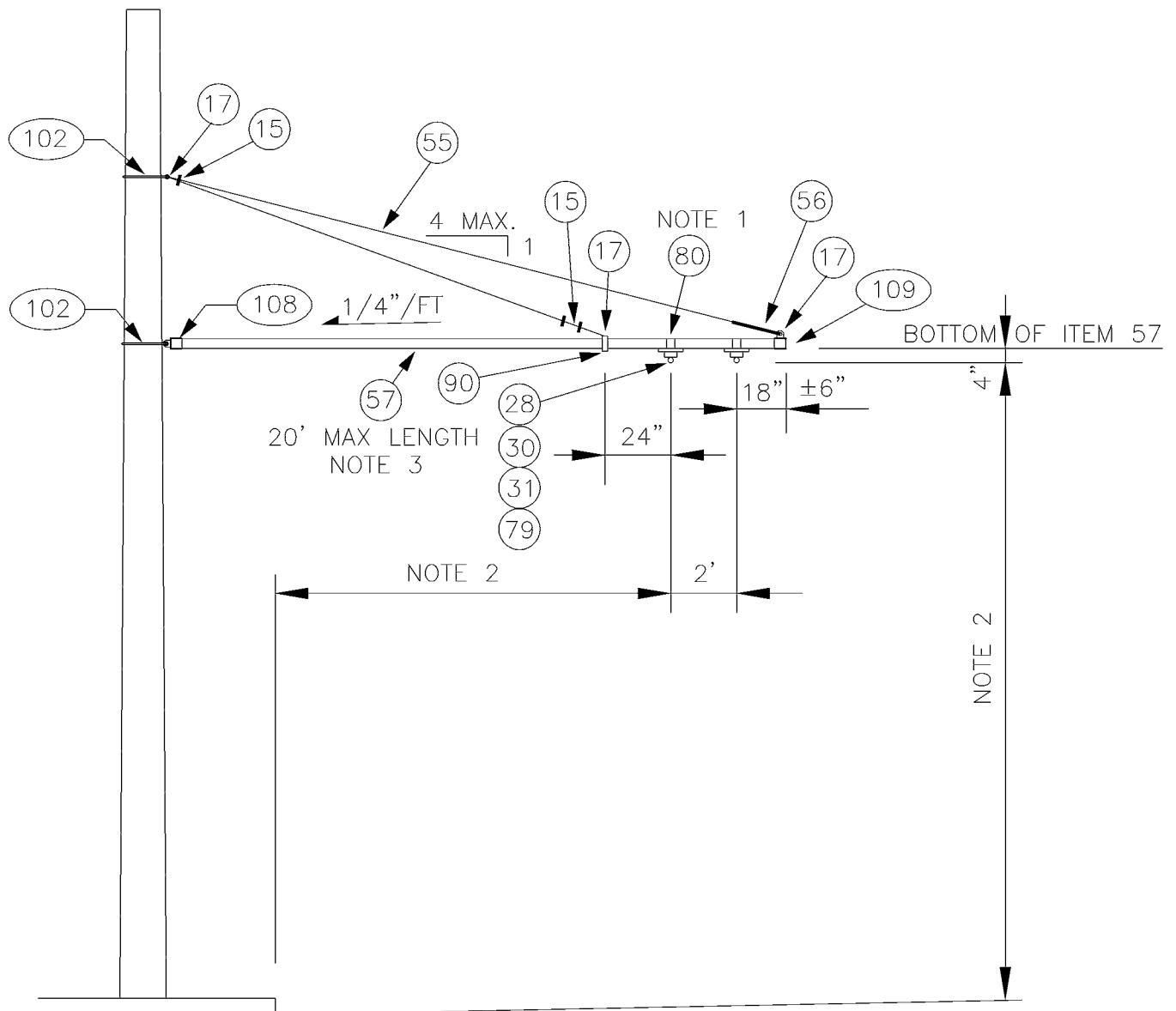
TROLLEY WIRE
SPREADER BAR

DATE:
OCT 95

FILE

DWG. NO.
SA-334

SHT 1 OF 1



NOTES:

1. STAINLESS STEEL BANDING SHALL BE WRAPPED DOUBLE THICKNESS AROUND ITEM 57 PRIOR TO CLAMPING.
2. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: MAY 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-341
APPROVED				SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	3	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	2	INSULATOR SPOOL	WABCO	16835-2000
30	2	TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31	2	SPRING DETROIT CLAMP	WABCO	54959-3001
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
79	2	5/8"-11 UNC X 1 3/8" STUD		
80	VARIES	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
90	1	HEAVY PIPE CLAMP, GALV, 3" IPS	GRINNELL	FIG. 216
102	2	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
109	1	MAST ARM ARM END CAP	METRO STD	SA-109

DESIGNED
DPG

CHKD:
DPG

DR:
DOW

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STEEL POLE
BRACKET ASSEMBLY
TANGENT CONSTRUCTION

DATE:
MAR 97

FILE

DWG. NO.

SA-341

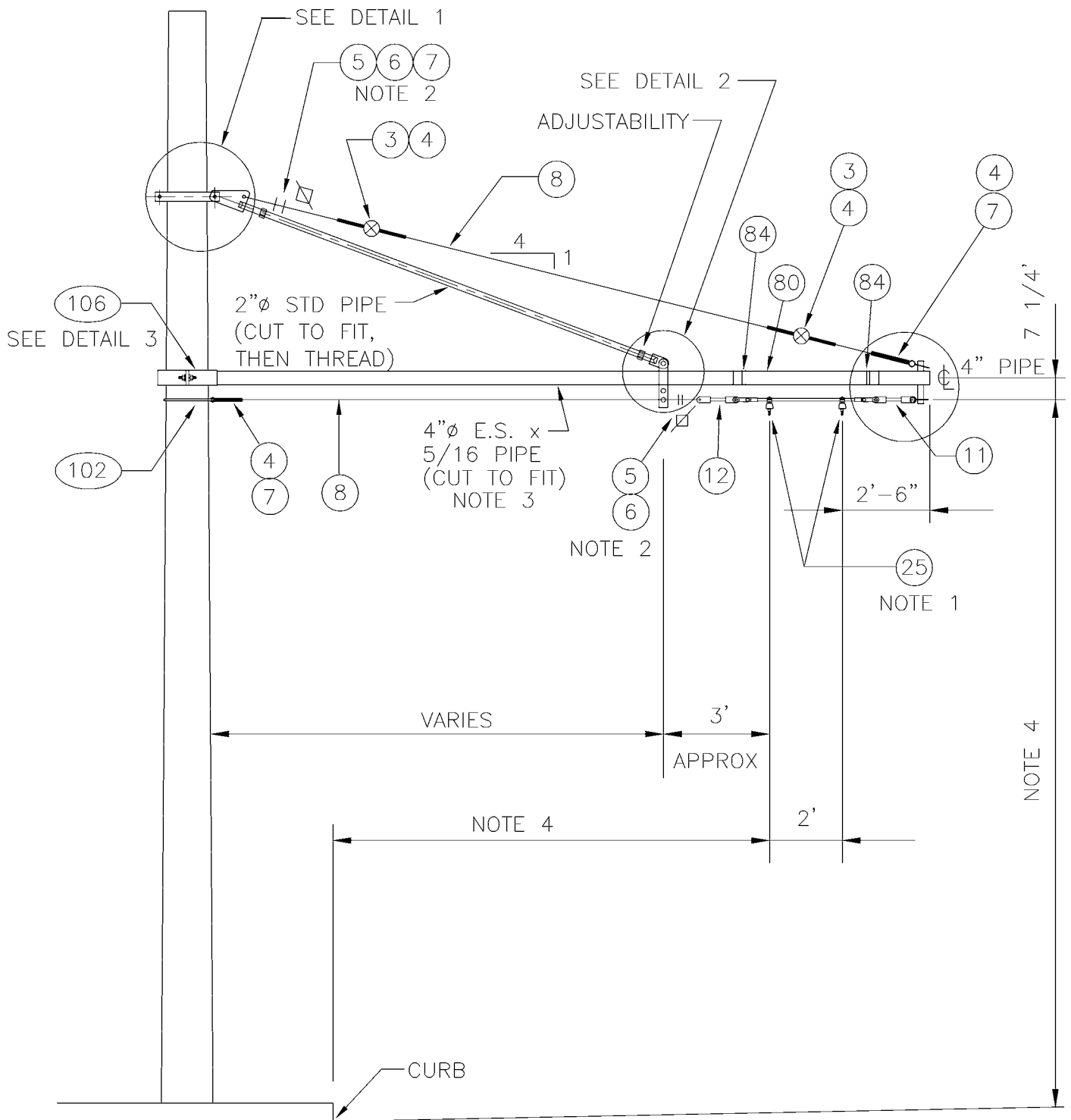
SHT 2 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	VARIES	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
11	VARIES	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
25	VARIES SEE PLAN	CURVE SEGMENT 8-12 DEG TYPE C CURVE SEGMENT 13-27 DEG TYPE C CURVE SEGMENT 28-47 DEG TYPE C	WABCO WABCO WABCO	22301-3014 22302-3005 22303-3005
40	VARIES	7/8 TRANSLITE STRAIN INSUL CL-90	WABCO	54995-6120
53	VARIES	CURVE RAIL (1° TO 5° 2 FT LG)	K & M	851 B412/0
54	VARIES	CURVE RAIL (5.5° TO 7.5° 4 FT LG)	K & M	851 B412/1
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" Ø X 1/4"	STRONGWELL	EXTREN SERIES 525
90	1	HEAVY PIPE CLAMP, GALV	GRINNELL	FIG. 216
102	3	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE BRACKET ASSEMBLY CURVE CONSTRUCTION	DATE: MARCH 00
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-342
APPROVED				SHT 2 OF 2

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DESIGNED
DPG

DR:
CMS

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STEEL POLE
BRACKET ASSEMBLY
COMPRESSION TYPE

DATE:

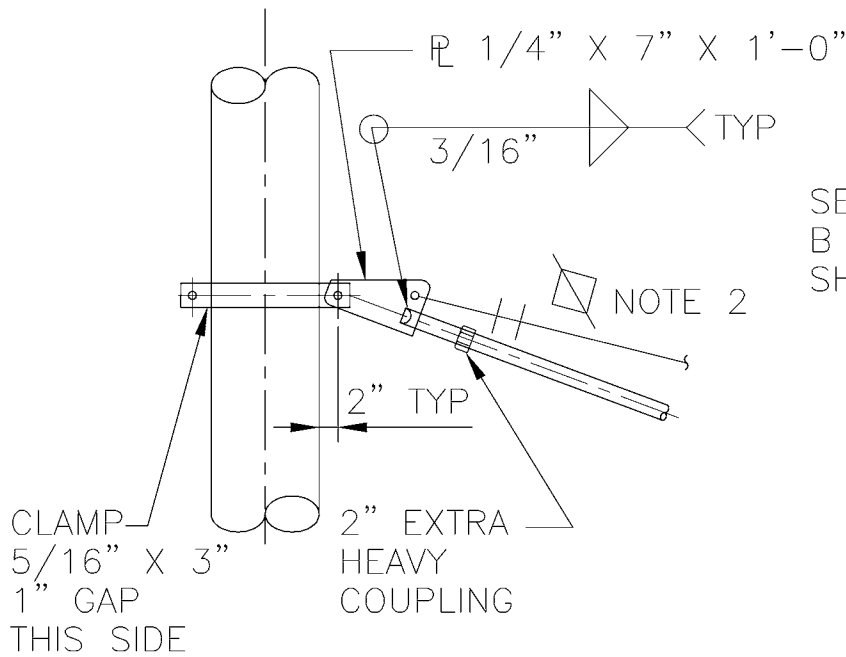
OCT 95

FILE

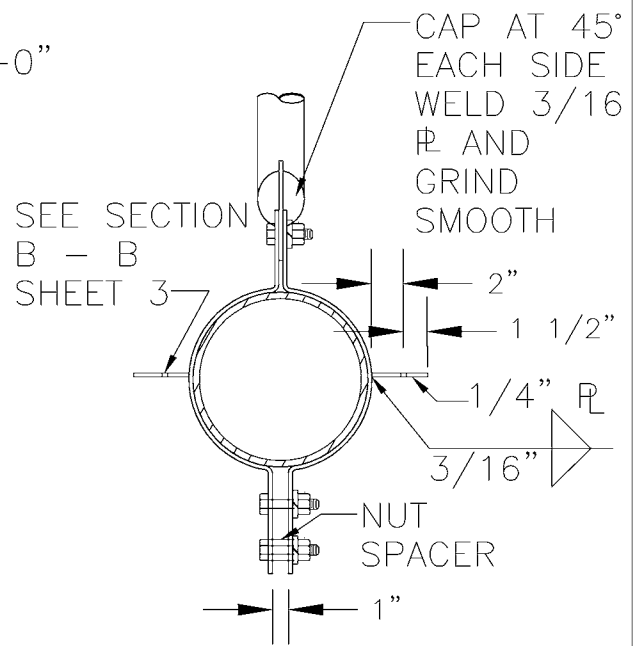
DWG. NO.

SA-343

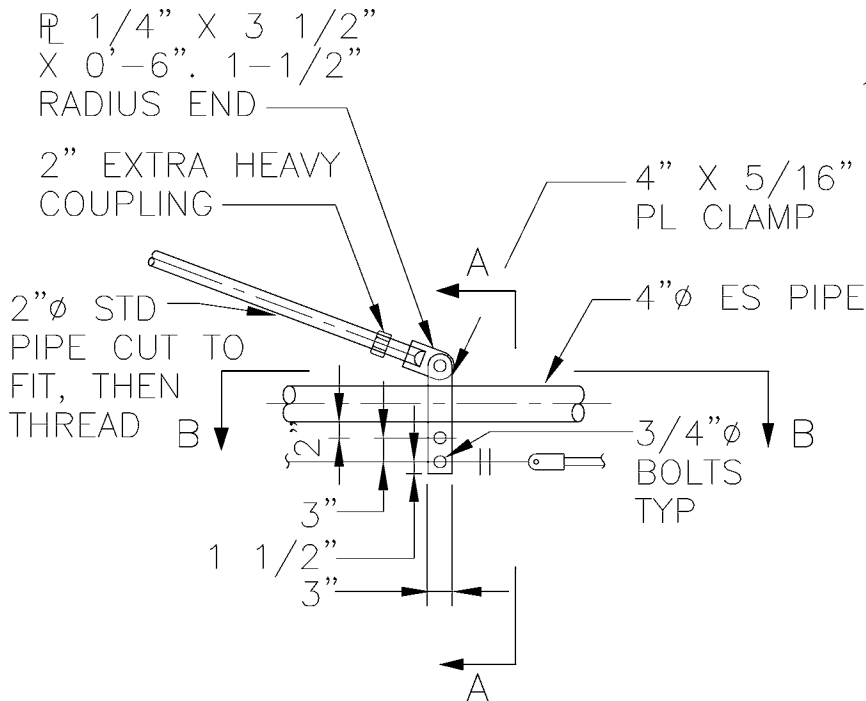
SHT 1 OF 4



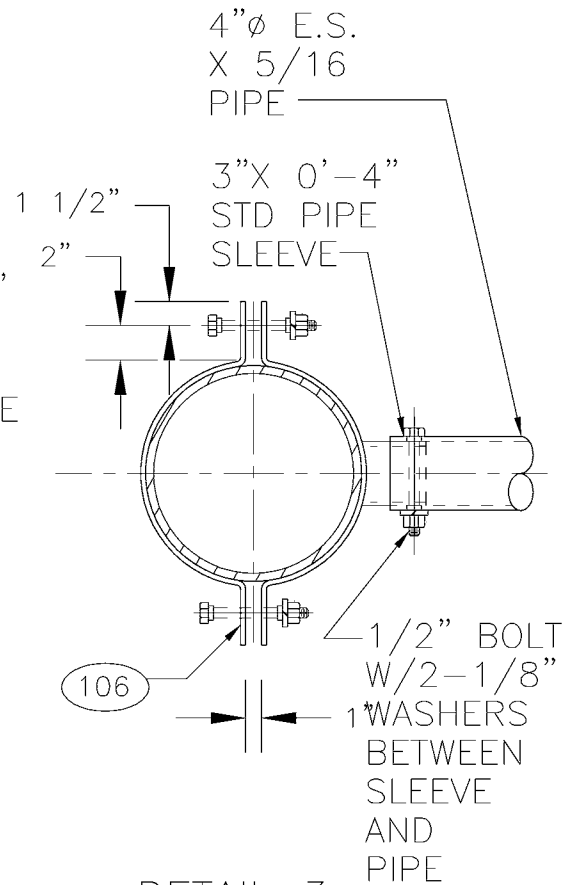
DETAIL 1



SECTION A-A



DETAIL 2



DETAIL 3

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DESIGNED D/G	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE BRACKET ASSEMBLY COMPRESSION TYPE	DATE: OCT 95
DR: CMS	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-343
APPROVED				SHT 2 OF 4

MATERIAL LIST

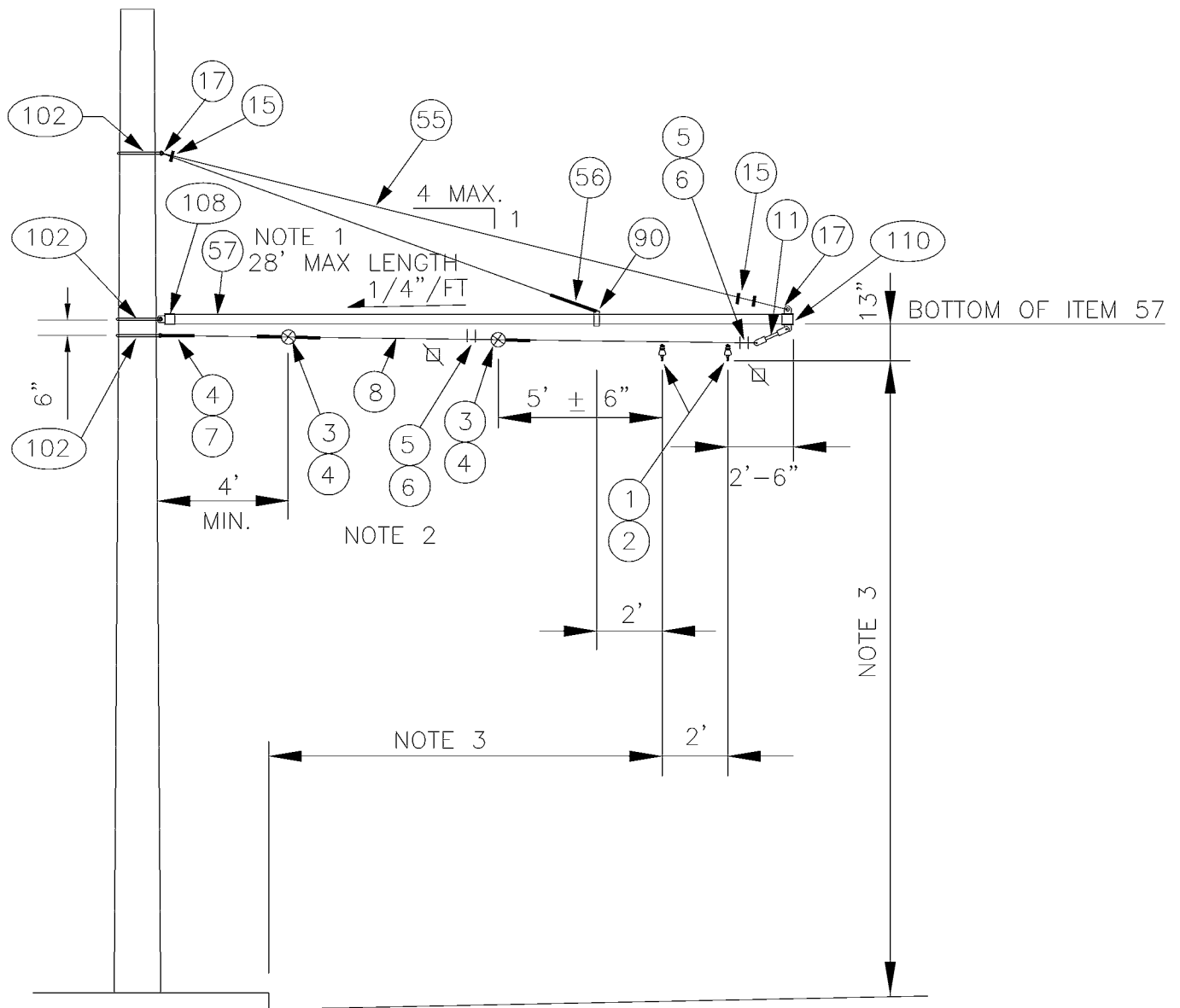
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	6	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	3	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	1	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
20	2	EYEBOLT	WABCO	11933-2000
80	VARIES	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
84	4 LF	SCHED 40 PVC, GREY, SPLIT		
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
106	1	COMPRESSION POLE BRACKET COLLAR	METRO STD	SA-106
233	2	SWAY BRACING, SA-233-8M	METRO STD	SA-233

NOTES:

- OVERHEAD DRAWINGS TO INDICATE CURVE SEGMENT TO BE INSTALLED. MAXIMUM ANGLE OF CURVE SEGMENT IS 35 DEGREES. MAXIMUM CHANGE IN STREET GRADIENT IS $\pm 5\%$
- PROVIDE TENSION ADJUSTMENT POINT AT LOCATION INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THIS LOCATION. SEE SA-166.
- THE PIPE BRACKET SHALL BE 4" DIAMETER EXTRA STRONG ASTM A53, GRADE B GALVANIZED STEEL PIPE.
MAXIMUM PIPE LENGTH IS 18 FT.
- SEE SA-164 FOR HORIZONTAL AND VERTICAL DIMENSIONS TO THE TROLLEY WIRE.

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE BRACKET ASSEMBLY COMPRESSION TYPE	DATE: OCT 95
DRAWN LOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-343
APPROVED				SHT 4 OF 4

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NOTES:

1. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 110 FOR INSERTION OF 3/8" SS BOLT.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⊠". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. HANG CLAMP (ITEM 1) VERTICAL BY ADJUSTING SPAN HANGER (ITEM 2).

DESIGNED
DPGDR:
AJW

RECOM.

APPROVED

CHKD:
AJWSCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDSSTEEL POLE
BRACKET ASSEMBLY
UNDERSLING CONSTRUCTIONDATE:
MARCH 00

FILE

DWG. NO.

SA-345

SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
02	2	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	4	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	1	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" Ø X 1/4"	STRONGWELL	EXTREN SERIES 525
90	1	HEAVY PIPE CLAMP, GALV	GRINNELL	FIG. 216
102	3	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110

DESIGNED
DPG

CHKD:
AJW

DR:
AJW

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STEEL POLE
BRACKET ASSEMBLY
UNDERSLING CONSTRUCTION

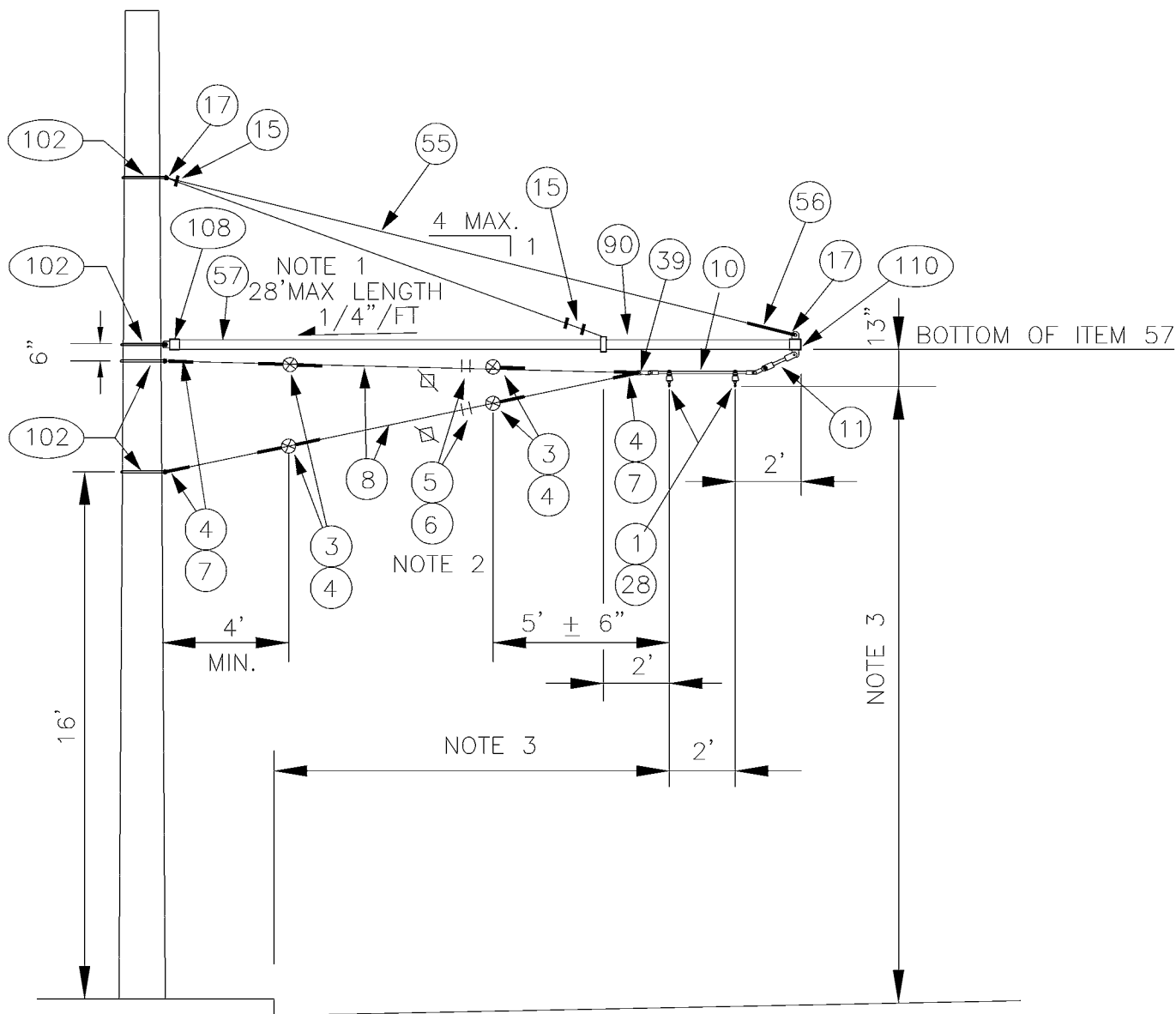
DATE:
MARCH 00

FILE

DWG. NO.

SA-345

SHT 2 OF 2



NOTES:

1. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 110 FOR INSERTION OF 3/8" SS BOLT.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. LEVEL CURVE HANGER (ITEM 10) BY ADJUSTING HANGER ARMS.

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STEEL POLE
HOLDDOWN BRACKET ASSEMBLY
TANGENT CONSTRUCTION

DATE:
MAR 00

FILE

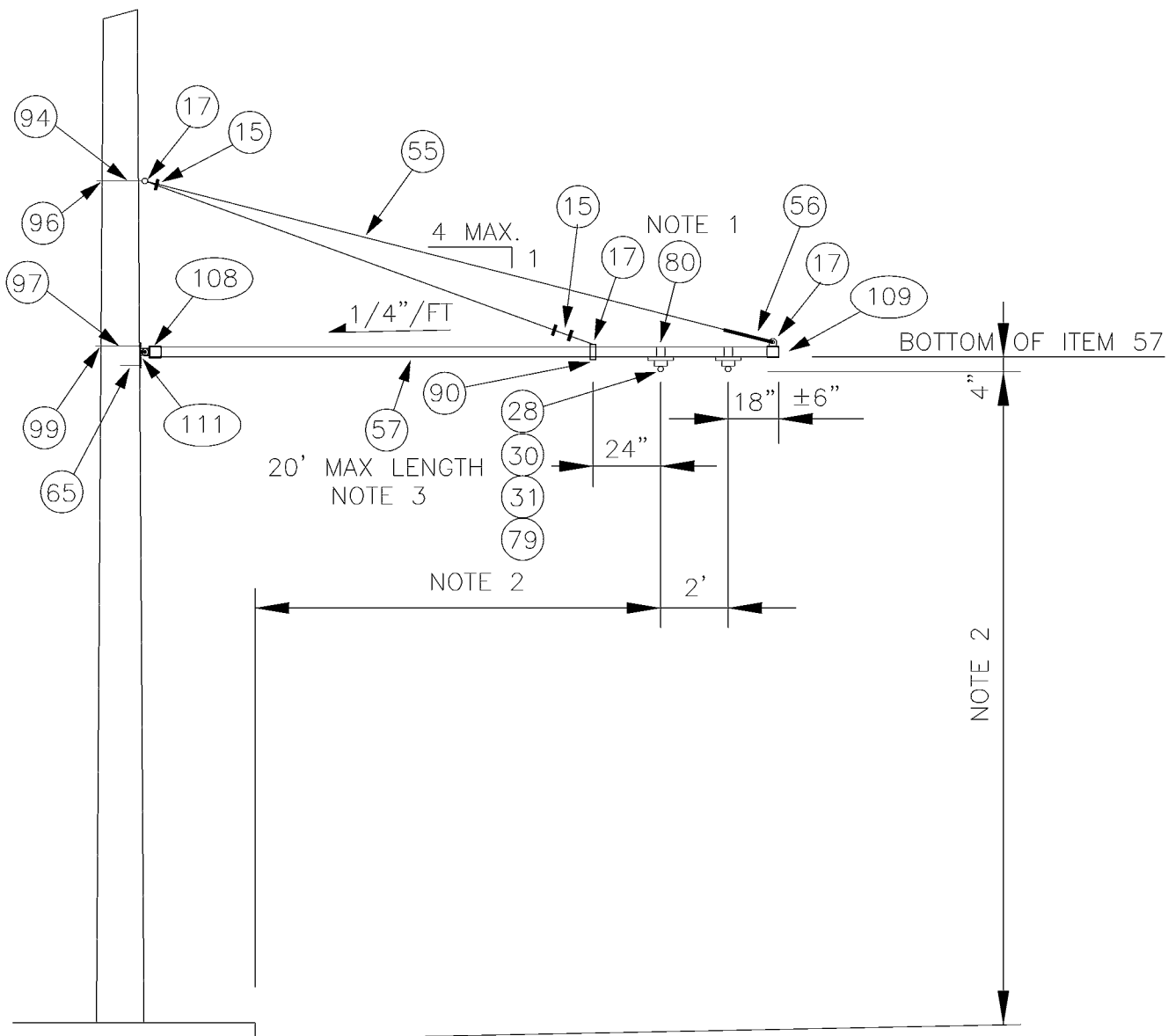
DWG. NO.

SA-348

SHT 1 OF 2

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	2	INSULATOR SPOOL	WABCO	16835-2000
39	1	5/8" SHACKLE	WABCO	13722-2000
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" Ø X 1/4"	STRONGWELL	EXTREN SERIES 525
90	1	HEAVY PIPE CLAMP, GALV	GRINNELL	FIG. 216
102	4	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110


DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE HOLDDOWN BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: MAR 00
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-348
APPROVED				SHT 2 OF 2



NOTES:

1. STAINLESS STEEL BANDING SHALL BE WRAPPED DOUBLE THICKNESS AROUND ITEM 57 PRIOR TO CLAMPING.
2. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.

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DESIGNED PDG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS WOOD POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: MAY 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-351
APPROVED				SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	3	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	2	INSULATOR SPOOL	WABCO	16835-2000
30	2	TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31	2	SPRING DETROIT CLAMP	WABCO	54959-3001
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
65	1	LAG SCREW, FETTER DRIVE, 1/2" X 4"	JOSLYN	J8754
79	2	5/8"-11 UNC X 1 3/8" STUD		
80	VARIES	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
90	1	HEAVY PIPE CLAMP, GALV, 3" IPS	GRINNELL	FIG. 216
94	1	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
96	1	SQ CURVED WASHER 3" X 3" X 1/4", 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	SQ CURVED WASHER 3" X 3" X 1/4", 13/16" DIA	JOSLYN	J6823
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
109	1	MAST ARM ARM END CAP	METRO STD	SA-109
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NTS

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

WOOD POLE
BRACKET ASSEMBLY
TANGENT CONSTRUCTION

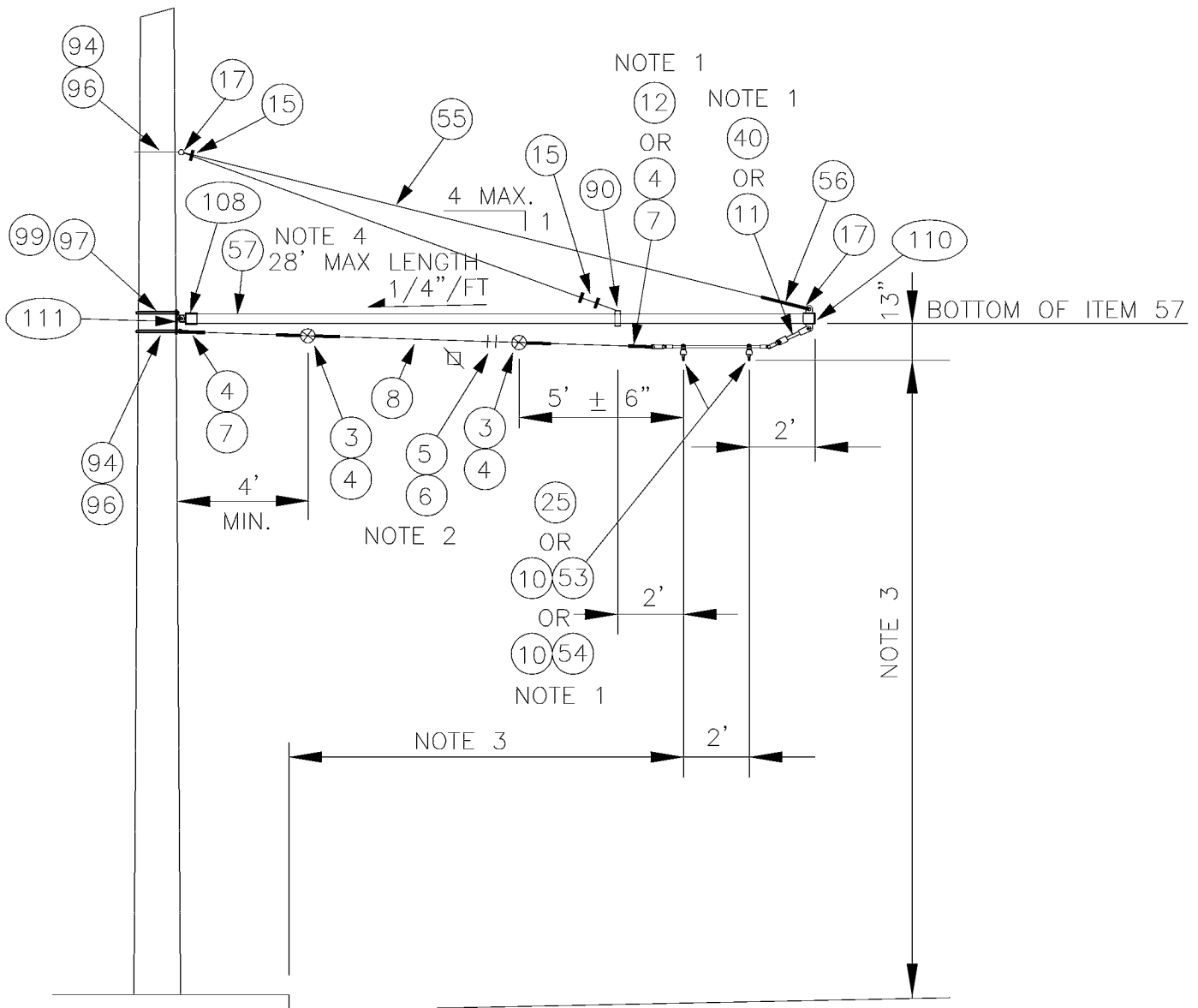
DATE:
MAR 97

FILE

DWG. NO.

SA-351

SHT 2 OF 2

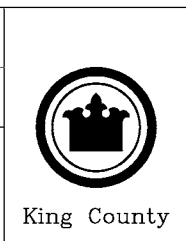


NOTES:

1. USE ITEMS 4,7,10,11 & 53 WHEN ANGLE VARIES FROM 1° TO 5°. USE ITEMS 4,7, 10,11 & 54 WHEN ANGLE VARIES FROM 5° TO 7.5°. USE ITEMS 12, 25, & 40 WHEN ANGLE IS GREATER THAN 8°. SEGMENTS SHALL NOT BE USED FOR ANGLES GREATER THAN 12° WHEN POLE IS ON INSIDE OF CURVE.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌘". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 110 FOR INSERTION OF 3/8" SS BOLT.
5. LEVEL CURVE HANGER (ITEM 10) BY ADJUSTING HANGER ARMS.

DESIGNED DPG	CHKD: DOW
DR: MM	SCALE: NONE
RECOM.	CONTRACT:
APPROVED	

CHKD: DOW
SCALE: NONE
CONTRACT:




DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

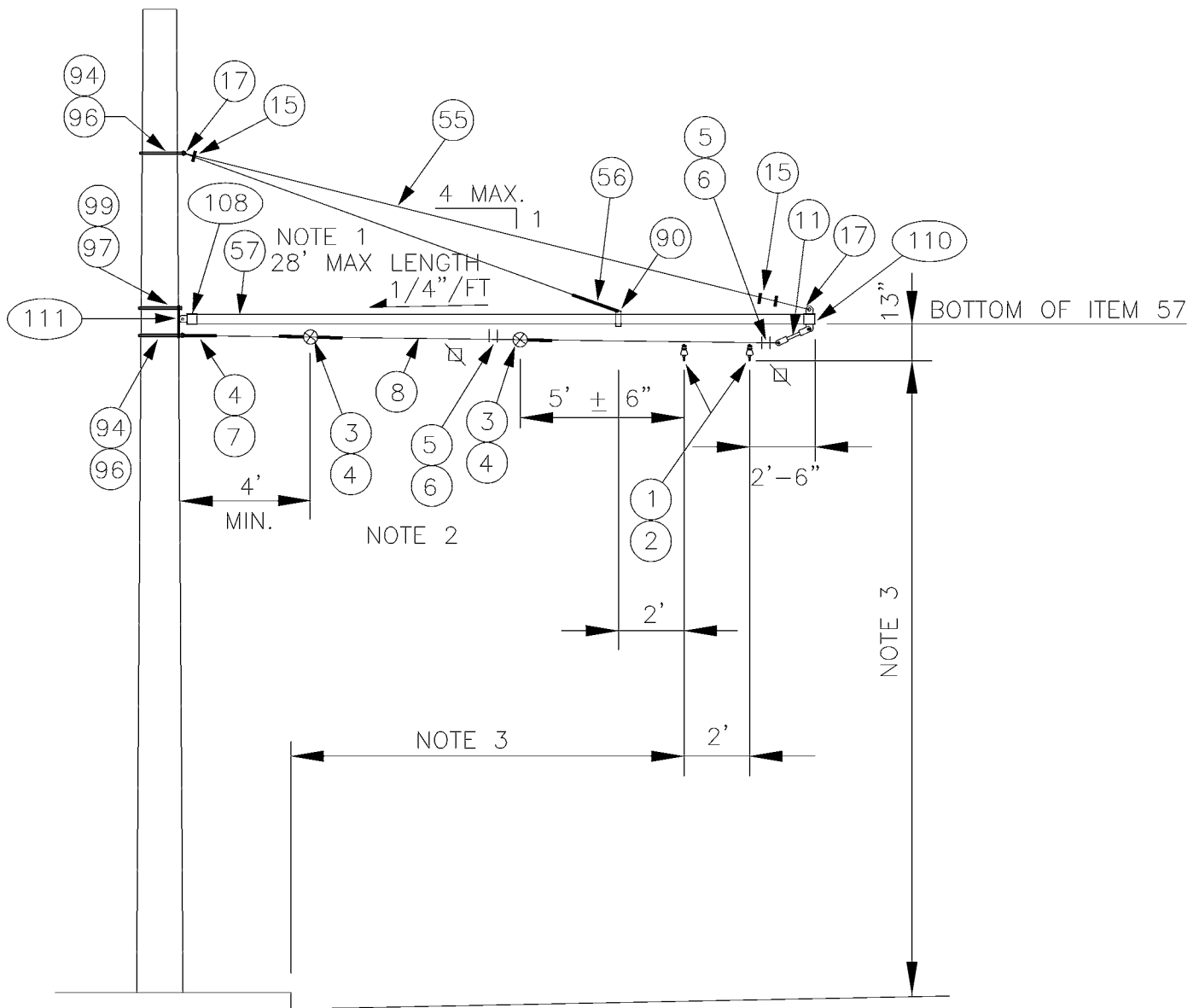
WOOD POLE
BRACKET ASSEMBLY
CURVE CONSTRUCTION

DATE: MAR 00
FILE
DWG. NO. SA-352
SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	VARIES	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
11	VARIES	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
25	VARIES SEE PLAN	CURVE SEGMENT 8-12 DEG TYPE C CURVE SEGMENT 13-27 DEG TYPE C CURVE SEGMENT 28-47 DEG TYPE C	WABCO WABCO WABCO	22301-3014 22302-3005 22303-3005
40	VARIES	7/8 TRANSLITE STRAIN INSUL CL-90	WABCO	54995-6120
53	VARIES	CURVE RAIL (1° TO 5° 2 FT LG)	K & M	851 B412/0
54	VARIES	CURVE RAIL (5.5° TO 7.5° 4 FT LG)	K & M	851 B412/1
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" Ø X 1/4"	MORRISON MOLDED FG	EXTREN SERIES 525
90	1	HEAVY PIPE CLAMP, GALV	GRINNELL	FIG. 216
94	2	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
96	2	SQ CURVED WASHER 3" X 3" X 1/4", 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	SQ CURVED WASHER 3" X 3" X 1/4", 13/16" DIA	JOSLYN	J6823
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS WOOD POLE BRACKET ASSEMBLY CURVE CONSTRUCTION	DATE: MAR 00
DR: MM	SCALE: NTS			FILE
RECOM.	CONTRACT:			DWG. NO. SA-352
APPROVED				SHT 2 OF 2



NOTES:

1. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 110 FOR INSERTION OF 3/8" SS BOLT.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⊠". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. HANG CLAMP (ITEM 1) VERTICAL BY ADJUSTING SPAN HANGER (ITEM 2).

DESIGNED
DPGDR:
AJW

RECOM.

APPROVED

CHKD:
AJWSCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDSWOOD POLE
BRACKET ASSEMBLY
UNDERSLING CONSTRUCTIONDATE:
MARCH 00

FILE

DWG. NO.

SA-355

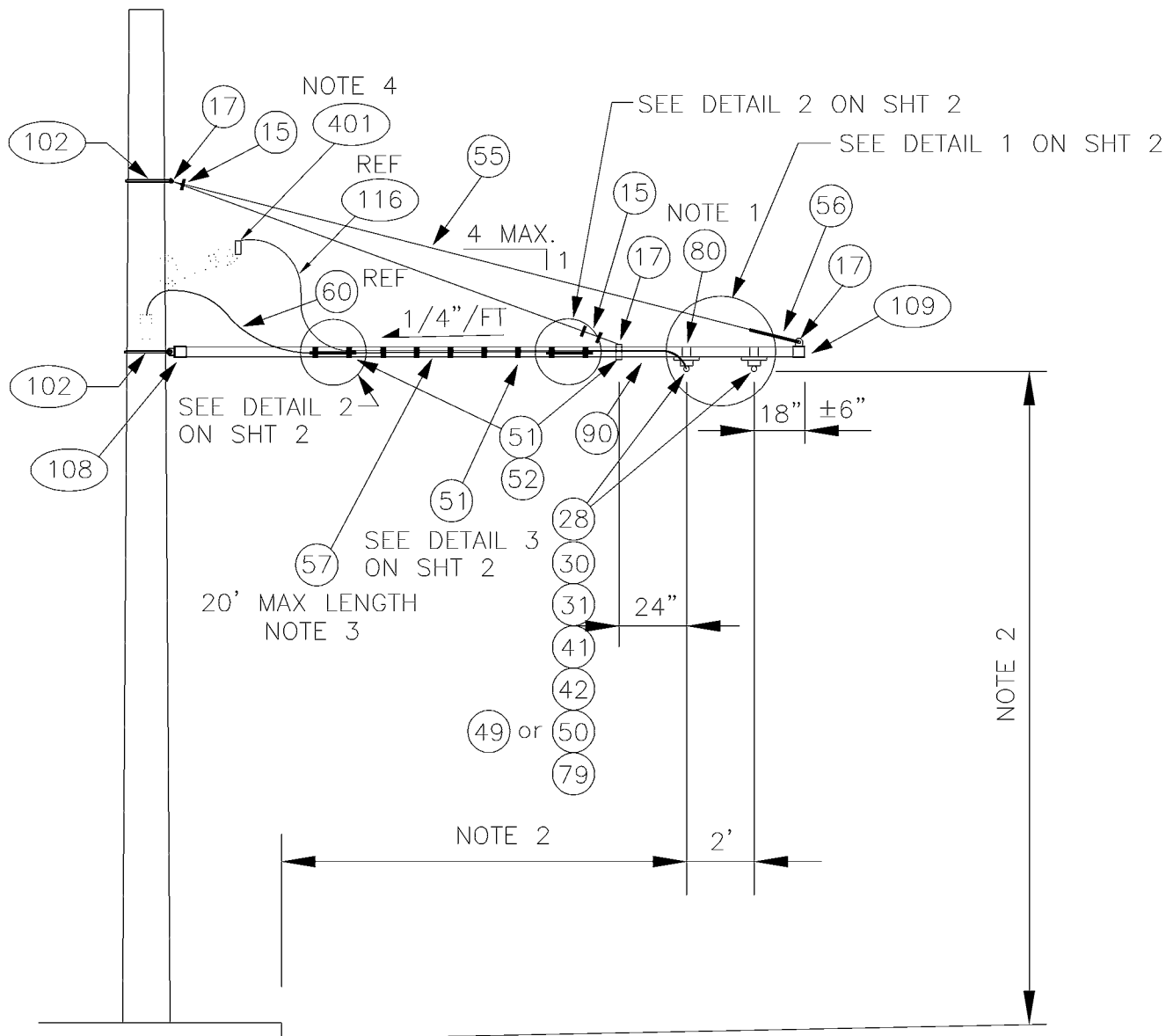
SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
02	2	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" Ø X 1/4"	STRONGWELL	EXTREN SERIES 525
90	1	HEAVY PIPE CLAMP, GALV	GRINNELL	FIG. 216
94	2	5/8" OVAL EYEBOLT WITH NUT	JOSLYN	J94XX
96	2	SQ CURVED WASHER 3" x 3" x 1/4" 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
102	3	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111

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DESIGNED DPG	CHKD: AJW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS WOOD POLE HOLDDOWN BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: MARCH 00
DR: AJW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-355
APPROVED				SHT 2 OF 2



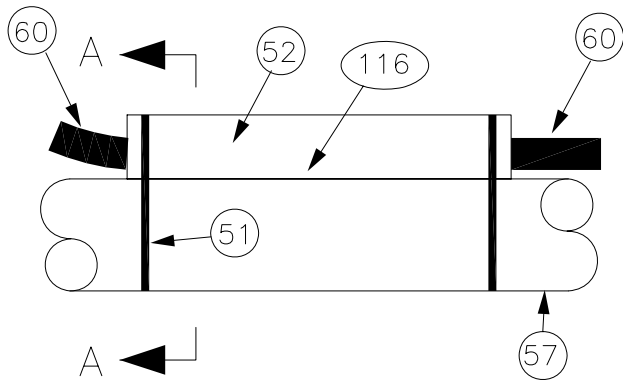
NOTES:

1. STAINLESS STEEL BANDING SHALL BE WRAPPED DOUBLE THICKNESS AROUND ITEM 57 PRIOR TO CLAMPING.
2. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.
4. 60, 116 & 401 SHOWN FOR REFERENCE ONLY, SEE SA-401 FOR DETAILS. DOUBLE NEGATIVE FEEDER REQUIRES ONLY ONE SA-401.

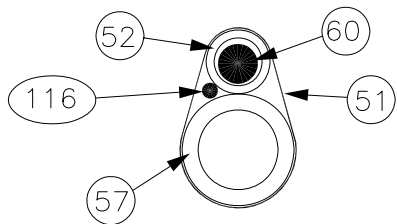
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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE TANGENT FEEDER BRACKET ASSEMBLY	DATE: MAY 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-349
APPROVED				SHT 1 OF 3

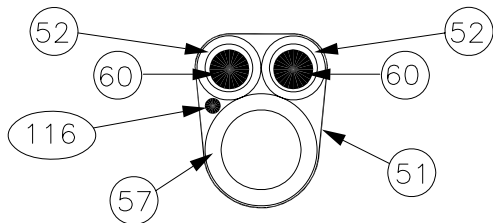
DOUBLE FEEDER



DETAIL 2

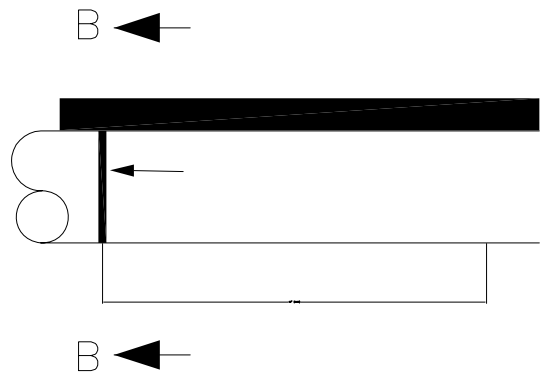


VIEW A-A
SINGLE FEEDER



VIEW A-A
DOUBLE FEEDER

SINGLE FEEDER



DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS STEEL POLE TANGENT FEEDER BRACKET ASSEMBLY	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-349
APPROVED				SHT 2 OF 3

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	3	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	2	INSULATOR SPOOL	WABCO	16835-2000
30	2	TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31	2	SPRING DETROIT CLAMP	WABCO	54959-3001
41	VARIES	H. S. P. FEEDER CLAMP ASSY, BRONZE	WABCO	19880-2000
42	VARIES	FEEDER CLAMP, BRONZE	WABCO	19790-4004
49	VARIES	COMPRESSION CONNECTOR COPPER-LONG BARREL-TIN PLATED-FLARED	ANDERSON/ SQUARE D	VHCL- 2/0-12BNF
50	VARIES	COMPRESSION CONNECTOR COPPER-LONG BARREL-TIN PLATED-FLARED	ANDERSON/ SQUARE D	VHCL- 500-12BNF
51	AS REQD	MULTI-LOK TIES (18") NYLON COATED	BAND-IT	AE714
52	2 12" PIECES	TUF NEOPRENE AIR HOSE SLEEVE 1.5" ID X 2.0625" OD (BLACK)	MCMaster- CARR	3 BRAID
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UN-SHIELDED, 5 KV EPR W/ PVC JACKET		
79	2	5/8"-11 UNC X 1 3/8" STUD		
80	VARIES	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
90	1	HEAVY PIPE CLAMP, GALV, 3" IPS	GRINNELL	FIG. 216
102	2	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
109	1	MAST ARM ARM END CAP	METRO STD	SA-109
116	VARIES	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

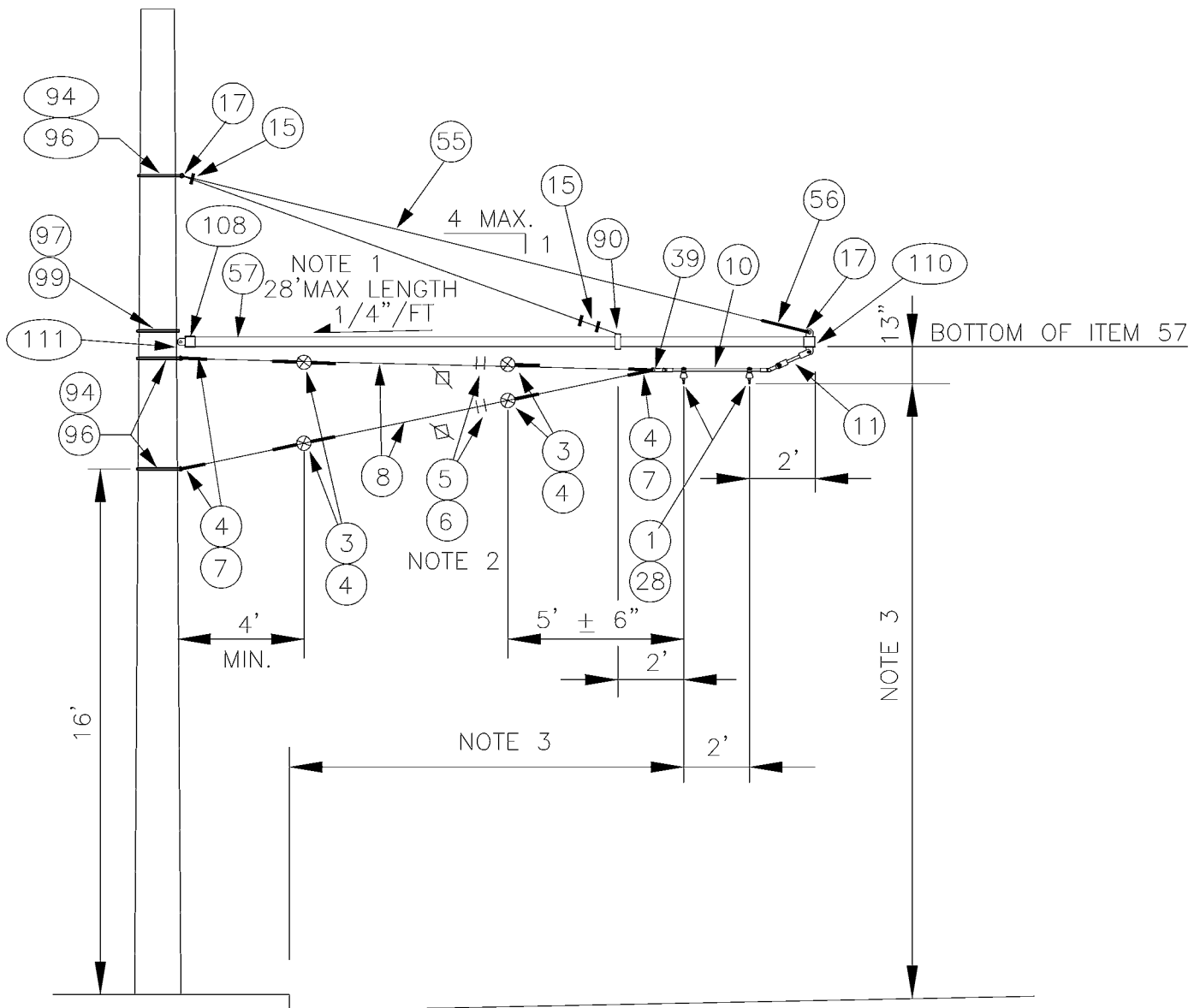
STEEL POLE
TANGENT FEEDER
BRACKET ASSEMBLY

DATE:
MAR 97

FILE

DWG. NO.
SA-349

SHT 3 OF 3



NOTES:

1. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⌘". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
4. LEVEL CURVE HANGER (ITEM 10) BY ADJUSTING HANGER ARMS.

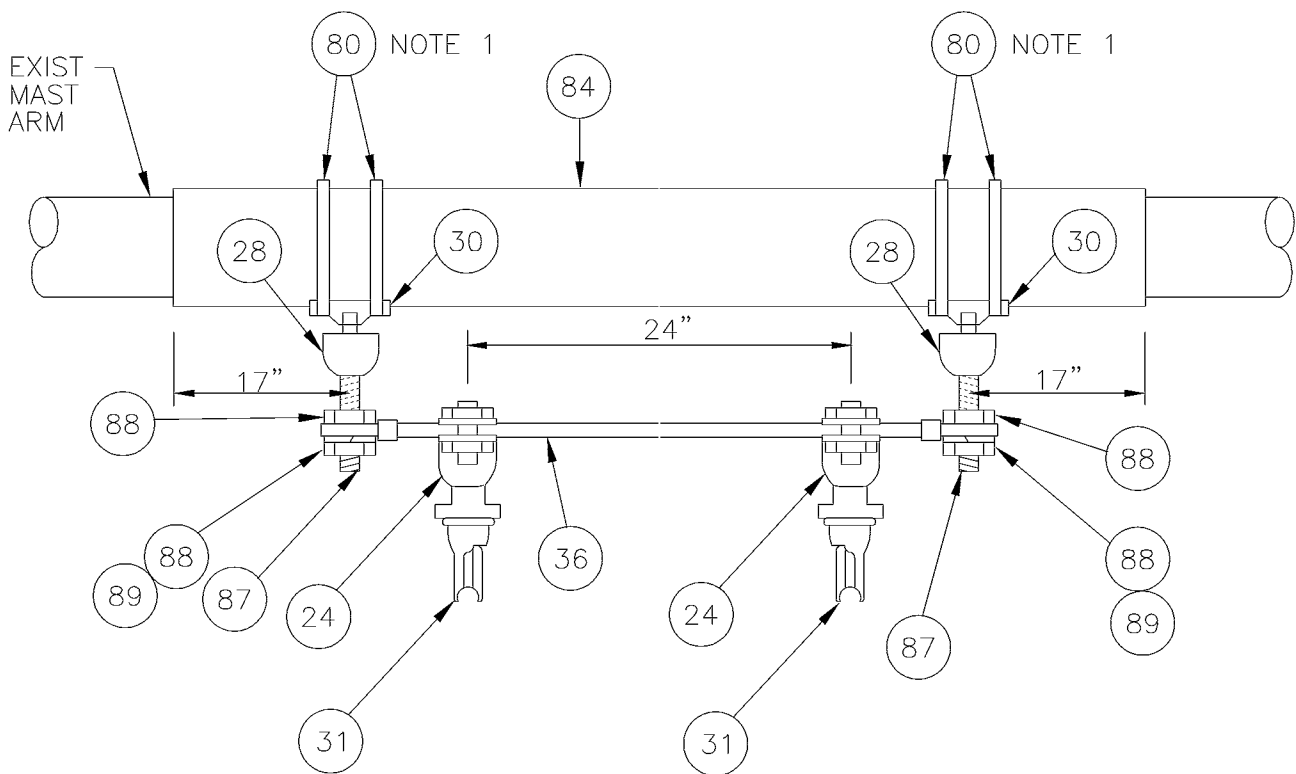
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DR: AJW	SCALE: NONE		WOOD POLE HOLDDOWN BRACKET ASSEMBLY	FILE
RECOM.	CONTRACT:		TANGENT CONSTRUCTION	DWG. NO. SA-358
APPROVED				SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	2	DETROIT CLAMP ASSY	WABCO	19293-3007
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	10	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
15	3	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	2	INSULATOR SPOOL	WABCO	16835-2000
39	1	5/8" SHACKLE	WABCO	13722-2000
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	1	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 5" Ø X 1/4"	STRONGWELL	EXTREN SERIES 525
90	1	HEAVY PIPE CLAMP, GALV	GRINNELL	FIG. 216
94	3	5/8" OVAL EYEBOLT WITH NUT	JOSLYN	J94XX
96	3	SQ CURVED WASHER 3" x 3" x 1/4" 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111
102	3	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110

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DESIGNED DPG	CHKD: AJW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS WOOD POLE HOLDDOWN BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: MARCH 00
DR: AJW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-358
APPROVED				SHT 2 OF 2



NOTES:

1. STAINLESS STEEL BANDING SHALL BE WRAPPED DOUBLE THICKNESS AROUND POLE COVERING MATERIAL PRIOR TO CLAMPING.
2. MATERIAL FOR THREADED RODS AND NUTS SHALL BE ASTM CLASS A-307 STEEL.
3. HOT DIP GALVANIZE ALL METAL AFTER FABRICATION.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
24	2	TROLLEY WIRE SUPPORT ASSY	WABCO	54962-3003
28	2	INSULATOR SPOOL	WABCO	16835-2000
30	2	TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31	2	SPRING DETROIT CLAMP	WABCO	54959-3001
36	1	7/8 TRANSLITE STRAIN INSUL W/ ADJUST END FITTINGS	WABCO	54980-6385
80	AS REQD	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
84	6 LF	SCHED 40 PVC, GREY, SPLIT		
87	2	5/8"-11 UNC X 6" THREADED ROD, GALV, ASTM A36		
88	4	5/8"-11 UNC HVY HEX JAM NUT, GALV, ASTM A563 GRA		
89	2	11/16" LOCKWASHER		

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

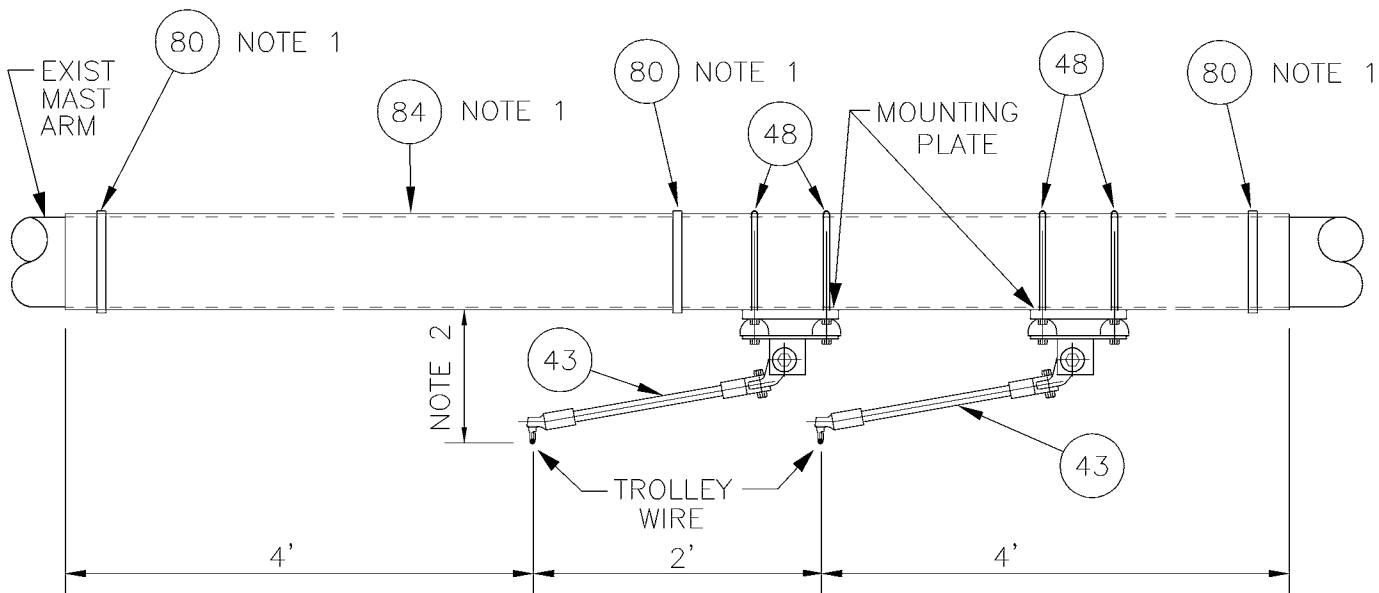
TRAFFIC MAST ARM
TROLLEY SUPPORT

DATE:
JUN 95

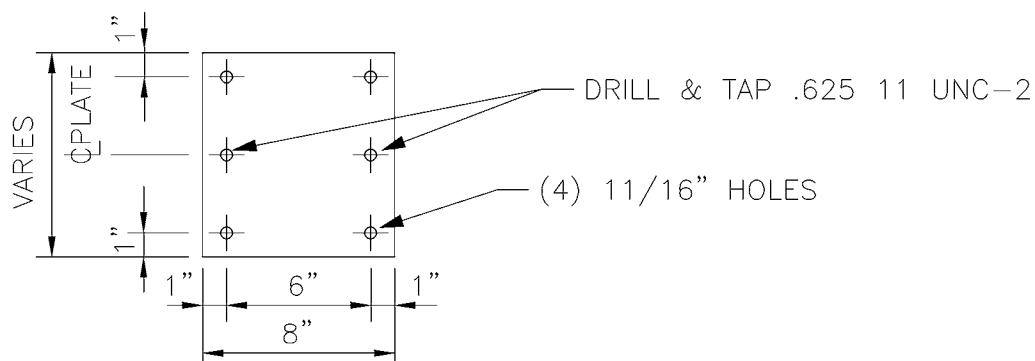
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DWG. NO.
SA-361

SHT 1 OF 1



OFFSET MOUNTING



3/4" MOUNTING PLATE

(2 REQ'D)

NOTES:

1. STAINLESS STEEL BANDING SHALL BE WRAPPED DOUBLE THICKNESS AROUND POLE COVERING MATERIAL PRIOR TO CLAMPING. PLACE SPLIT DOWN ON ITEM 84.
2. DISTANCE VARIES. ITEMS 43 & 48 NOT REQ'D WHEN GREATER THAN 18". USE OUTBOARD MOUNTING (SEE PAGE 1) WHEN LESS THAN 9", OR ROTATE ONE ITEM 43 15° OUT OF THE PAPER & ONE ITEM 43 15° INTO THE PAPER.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
43	2	TROLLEY WIRE SUPPORT ASSY	WABCO	59690-3001
48	4	5/8" U-BOLT GALV		
80	AS REQD	3/4" X 0.030" SS BANDING TYPE 201	BAND-IT	C206
84	10 LF	SCHED 40 PVC, GREY, SPLIT		

DESIGNED
DOW

DR:
DOW

RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

TRAFFIC MAST ARM
TROLLEY SUPPORT

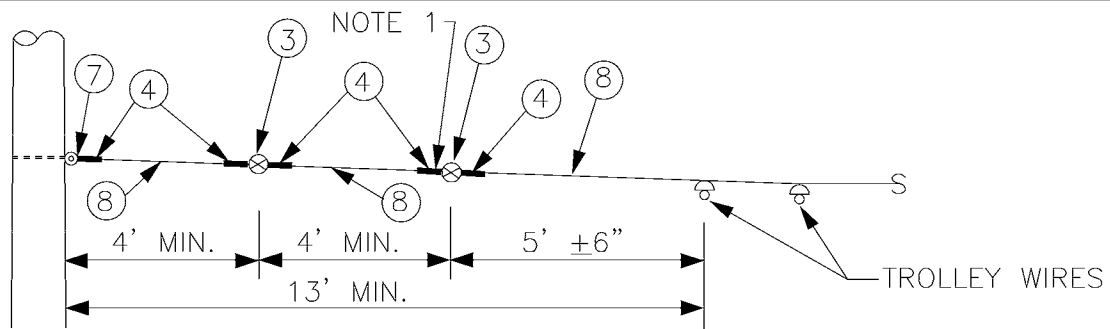
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DWG. NO.

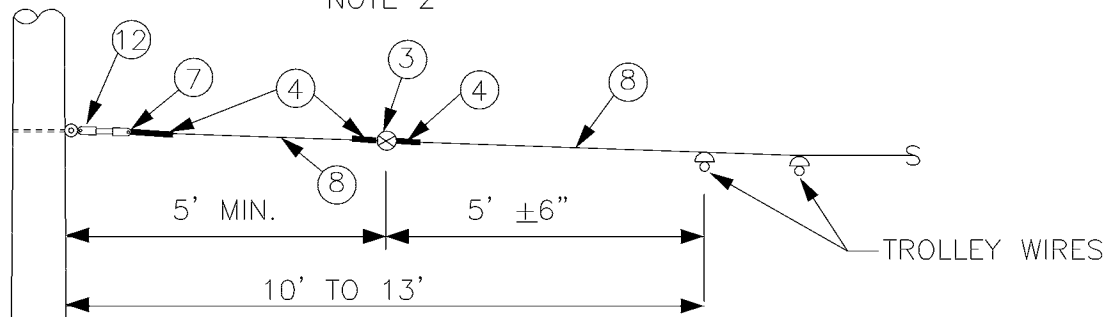
SA-362

SHT 2 OF 2

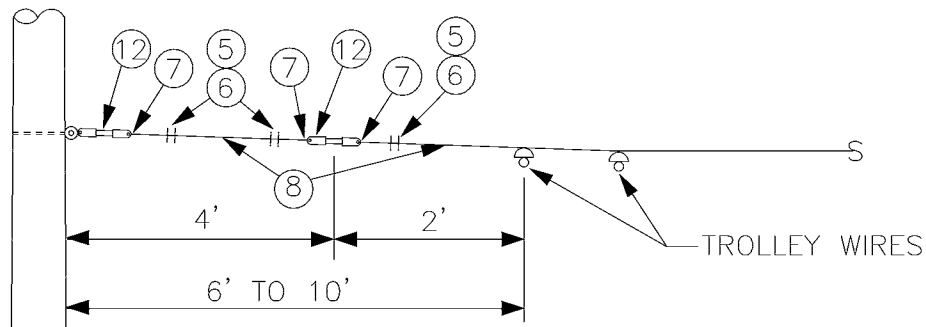


NORMAL SPAN

NOTE 2



ALTERNATE SPAN A



ALTERNATE SPAN B

NOTES:

1. WHERE ADJUSTABILITY IS REQUIRED, REPLACE GUY GRIP DEADEND (ITEM 4) WITH WIRE ROPE CLIPS (ITEM 5 & 6). SEE SA-166.
2. INCLUDES SA-301, SA-302, SA-305, SA-311, SA-312 & SA-315.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	VARIES	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SPAN WIRES
LIMITED SPACE
TYPICAL VARIANCES

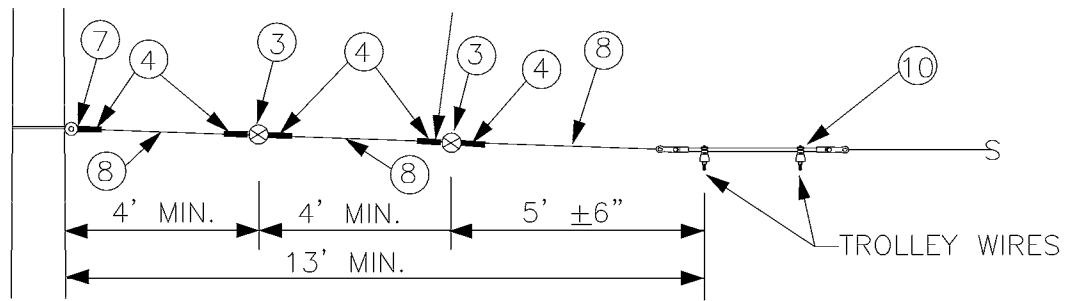
DATE:
OCT 95

FILE

DWG. NO.

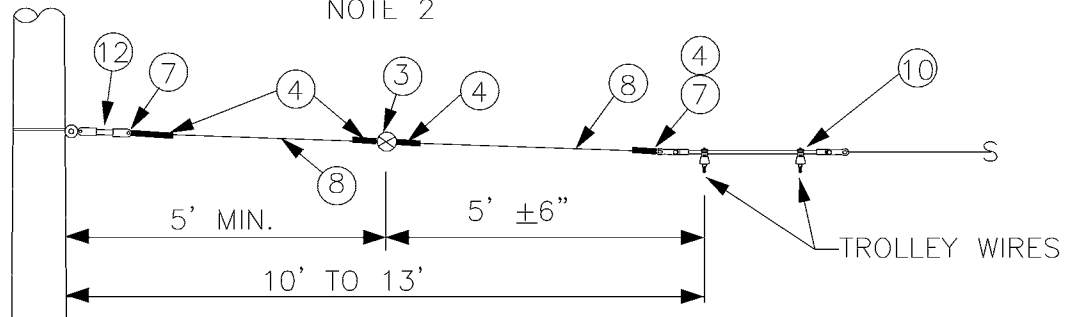
SA-370

SHT 1 OF 2

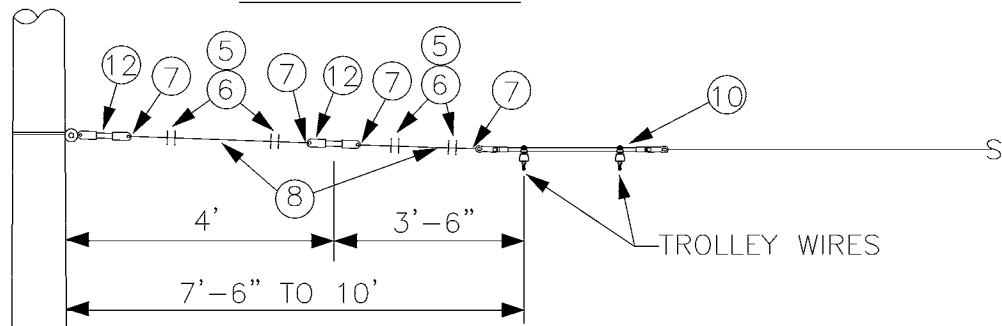


NORMAL SPAN

NOTE 2



ALTERNATE SPAN A



ALTERNATE SPAN B

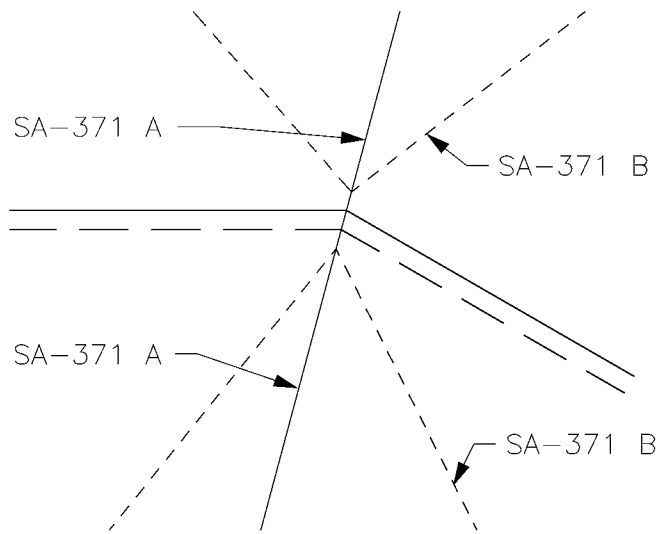
NOTES:

- WHERE ADJUSTABILITY IS REQUIRED, REPLACE GUY GRIP DEADEND (ITEM 4) WITH WIRE ROPE CLIPS (ITEM 5 & 6). SEE SA-166.
- INCLUDES SA-303, SA-304, SA-307, SA-308, SA-313 & SA-314, SA-317 & SA-318.

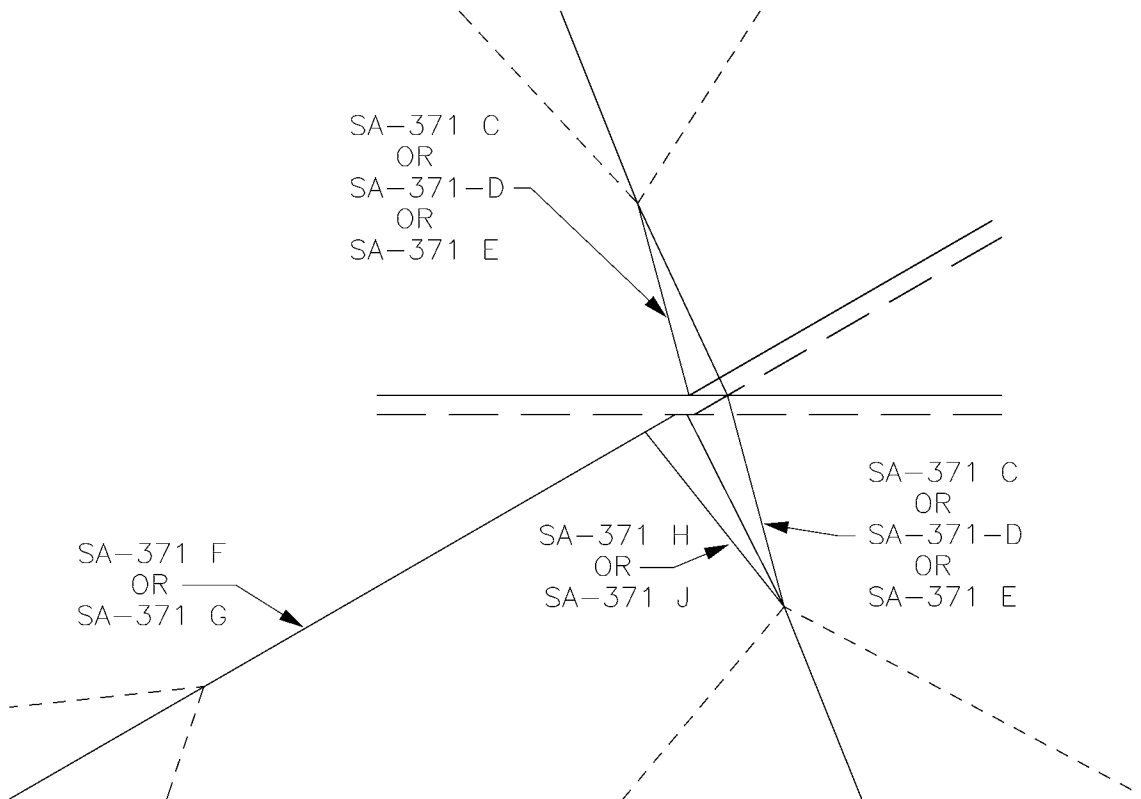
MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	VARIES	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	VARIES	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SPAN WIRES LIMITED SPACE TYPICAL VARIANCES	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-370
APPROVED				SHT 2 OF 2



CURVE SEGMENT PULLOFFS



SWITCH PULLOFFS

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SWITCH & CURVE SEGMENT PULLOFFS	DATE: NOV 94
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-371
APPROVED				SHT 1 OF 9

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. LOCATION OF ADJUSTMENT POINT, INSULATORS AND USE OF INSULATED GUY STRAND GUY STRAND SHALL MEET SA-167 REQUIREMENTS.
4. OUTSIDE PULLOFFS ARE SHOWN FOR CURVE SEGMENTS, INSIDE PULLOFFS ARE SIMILAR. INSIDE PULLOFFS ARE SHOWN FOR SWITCHES, OUTSIDE PULLOFFS ARE SIMILAR.
5. TROLLEY WIRE TO STRUCTURAL ATTACHMENT DISTANCE DETERMINES IF A SHORT, MEDIUM OR LONG VERSION IS USED FOR SA-371 A THROUGH SA-371 E.
6. TROLLEY WIRE GEOMETRY AS SHOWN ON THE OVERHEAD DRAWINGS DETERMINES WHICH SA-371 A THROUGH SA-371 K TO USE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
09	*	BULL RING	WABCO	18567-2000
11	*	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	*	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103
GUY TENSIONS- 0-2700 LBS				
03	*	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	*	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	*	WIRE ROPE CLIP, 5/16"	CROSBY	G450
07	*	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
GUY TENSIONS- 2700-5000 LBS				
13	*	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	*	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	*	WIRE ROPE CLIP, 3/8"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M
17	*	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
43	*	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	56273-6120
48	*	Y CLEVIS EYE CONNECTION	LINE HARDWARE	YCE-30

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SWITCH & CURVE
SEGMENT PULLOFFS

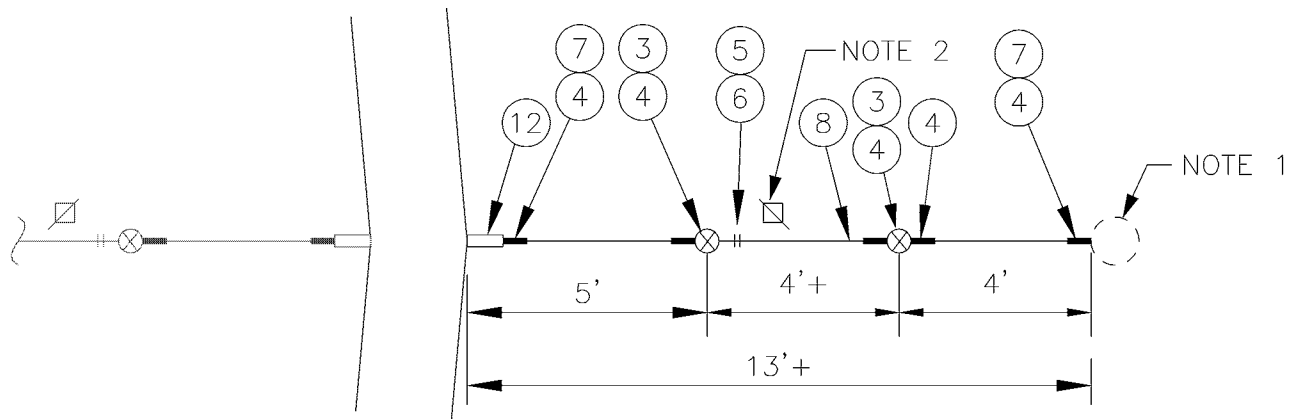
DATE:
OCT 95

FILE

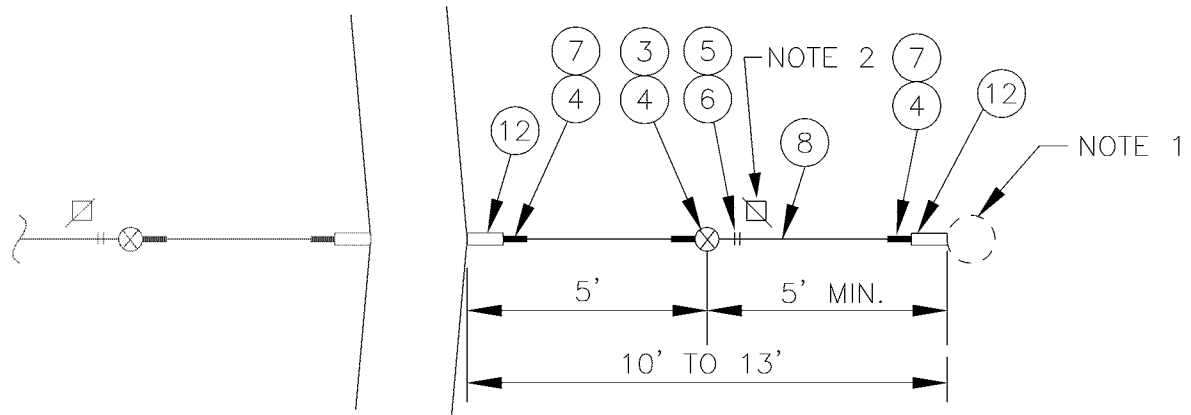
DWG. NO.

SA-371

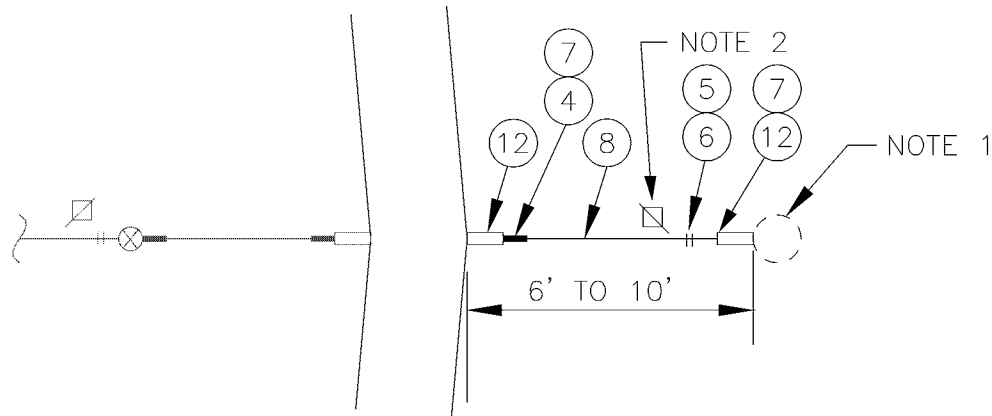
SHT 2 OF 9



SA-371 A (LONG)




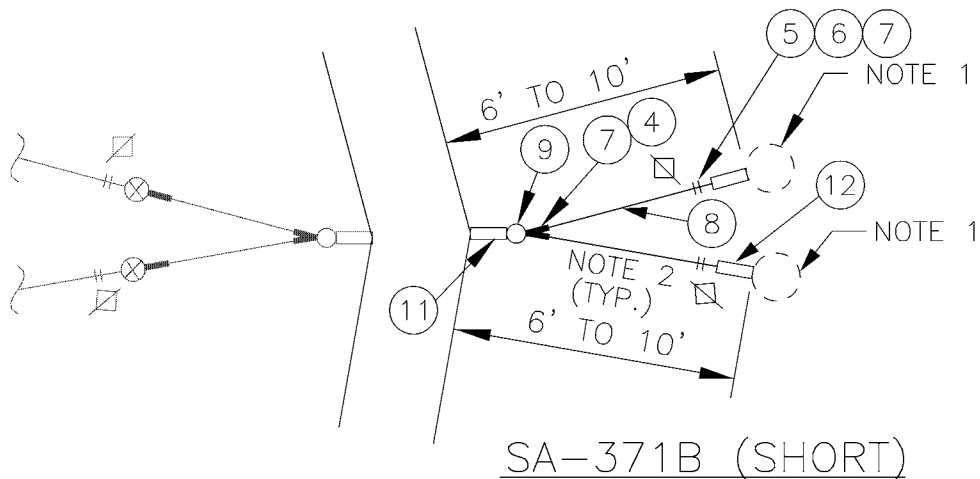
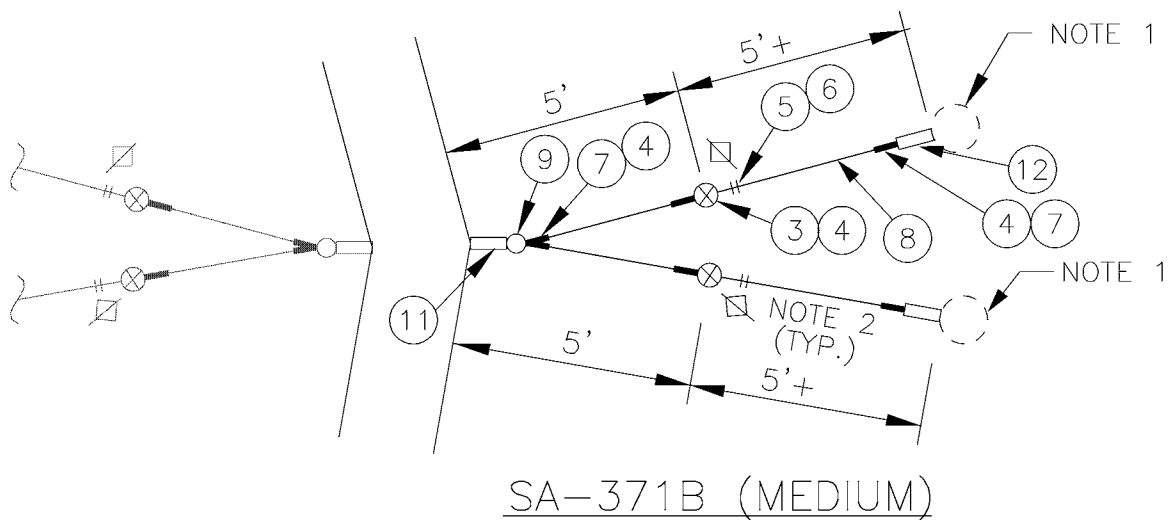
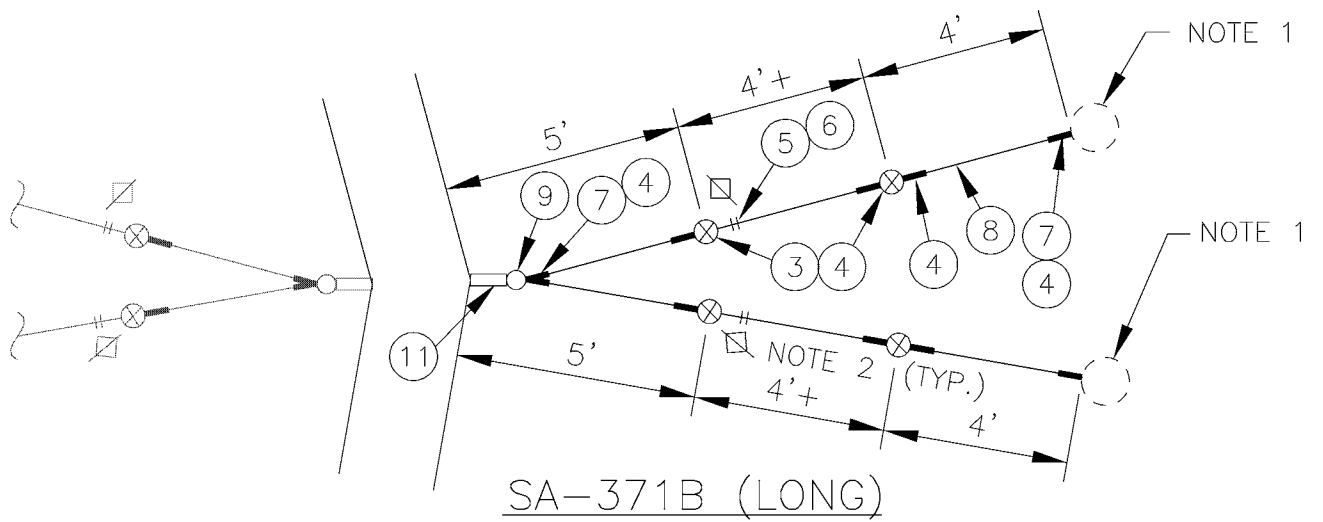
SA-371 A (MEDIUM)



SA-371 A (SHORT)

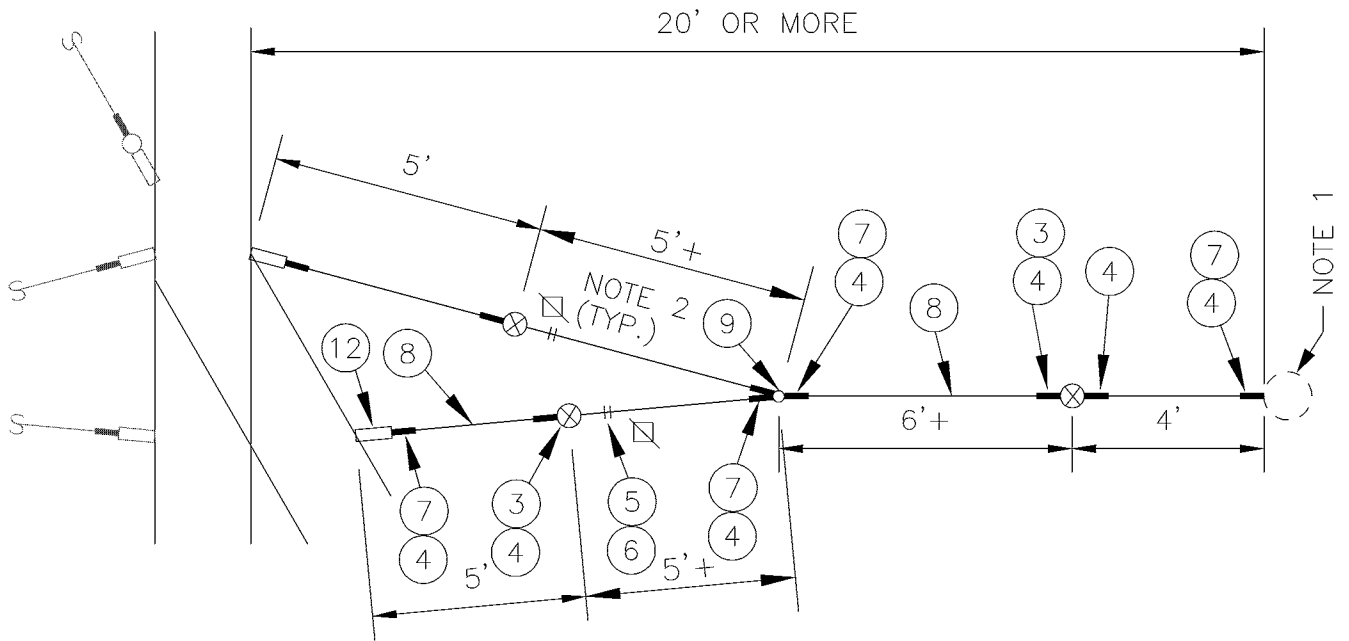
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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS CURVE SEGMENT PULLOFFS	DATE: JUN 95
DR: TMB	SCALE:			FILE
RECOM.	CONTRACT:			DWG. NO. SA-371
APPROVED				SHT 3 OF 9

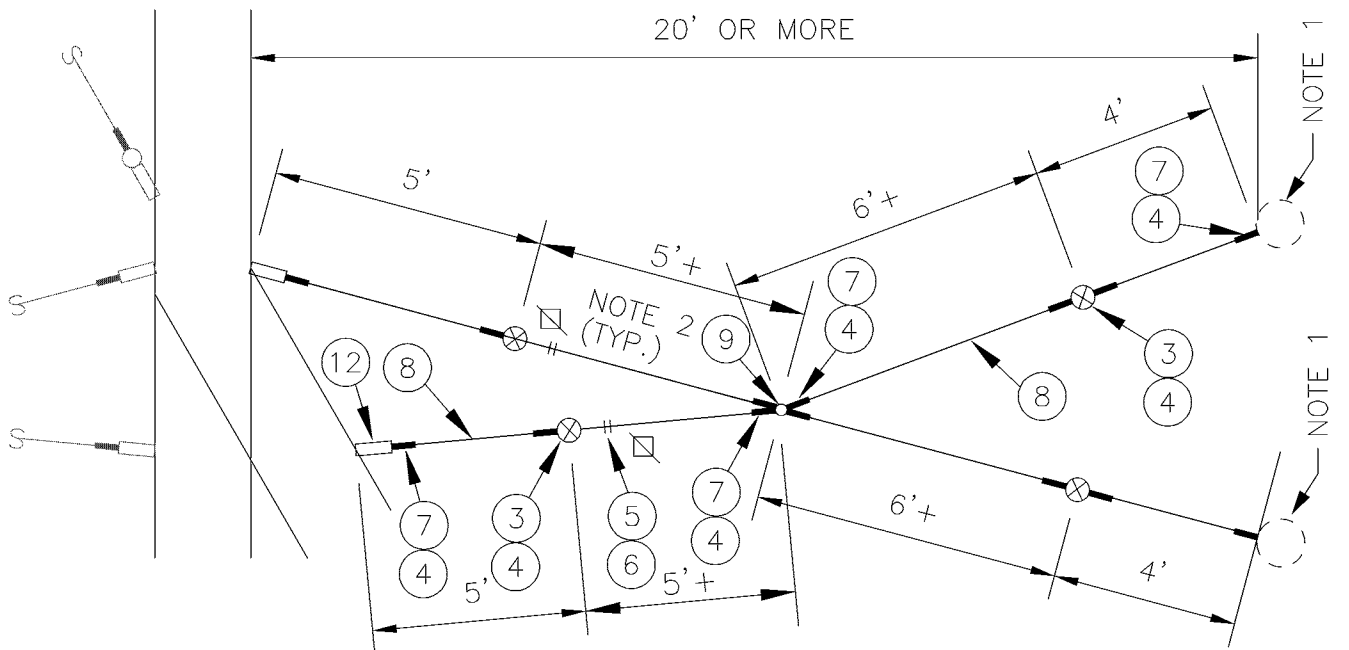


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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS CURVE SEGMENT PULLOFFS	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-371
APPROVED				SHT 4 OF 9



SA-371D



SA-371E

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SWITCH
PULLOFFS

DATE:

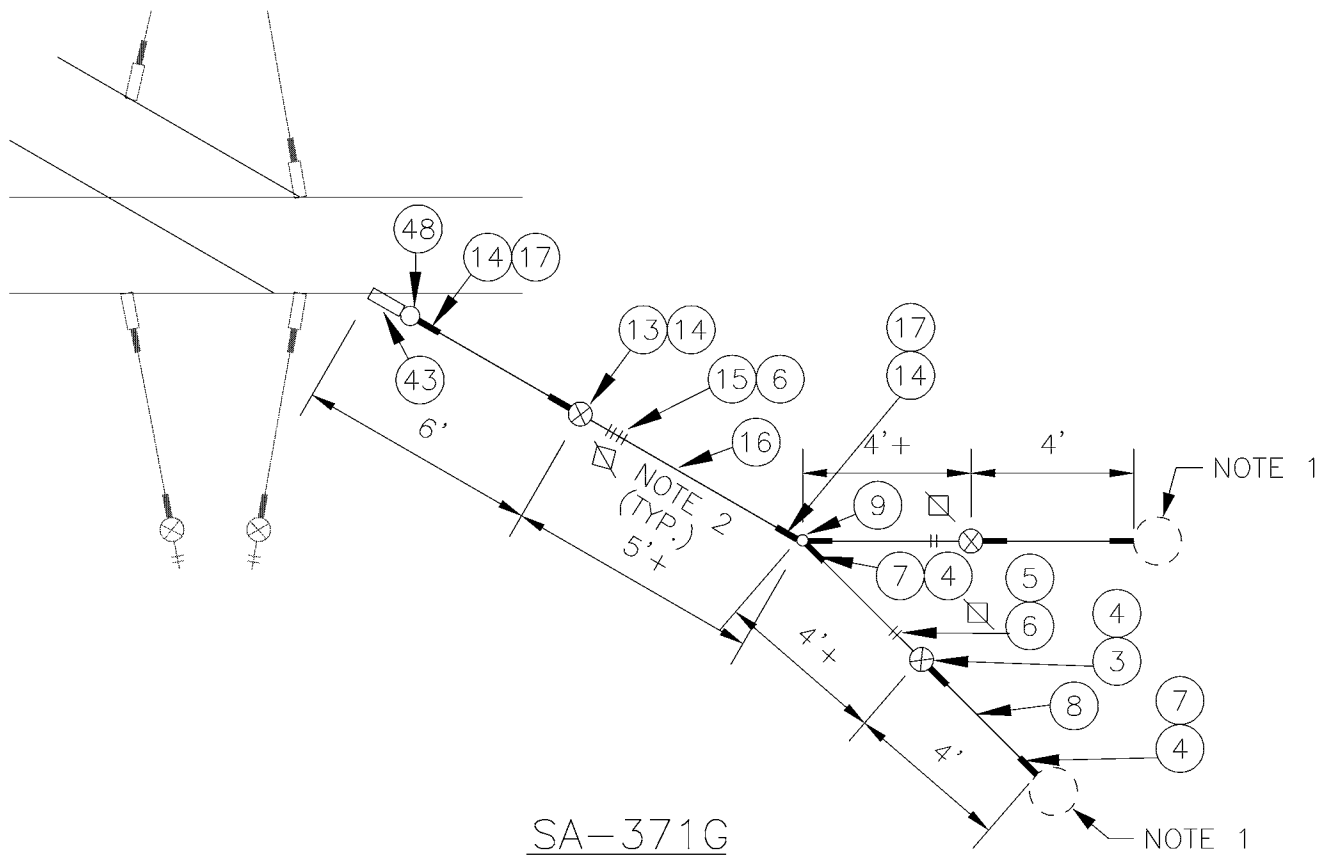
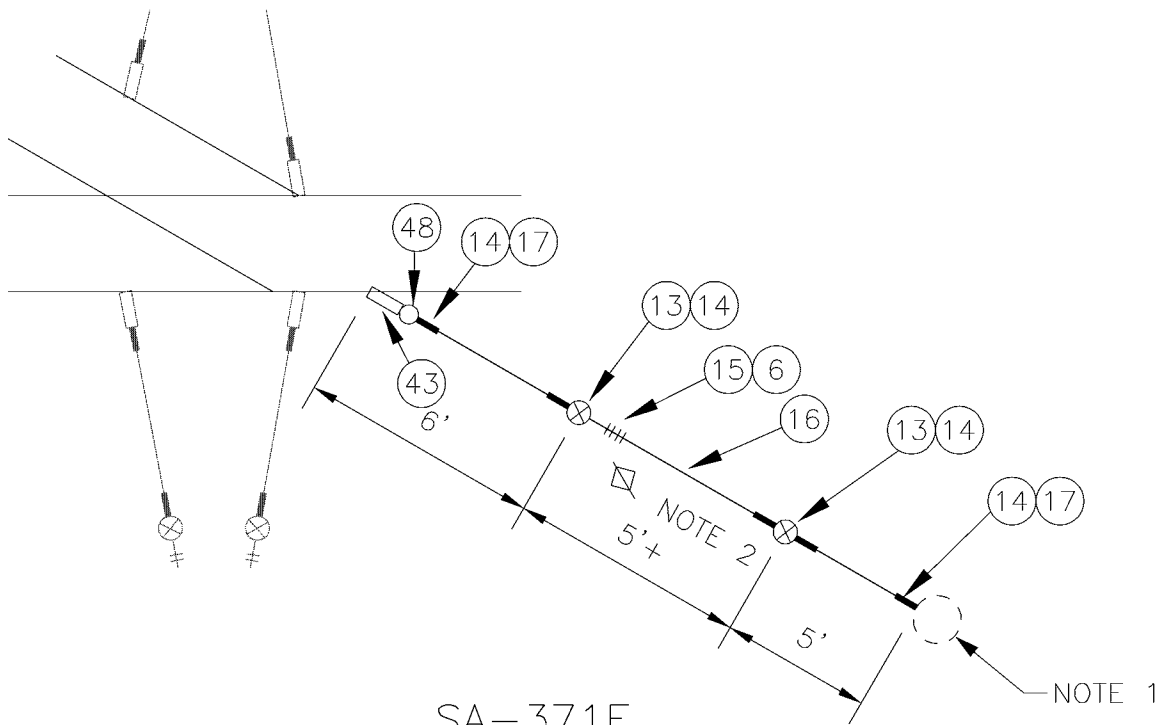
JUN 95

FILE

DWG. NO.

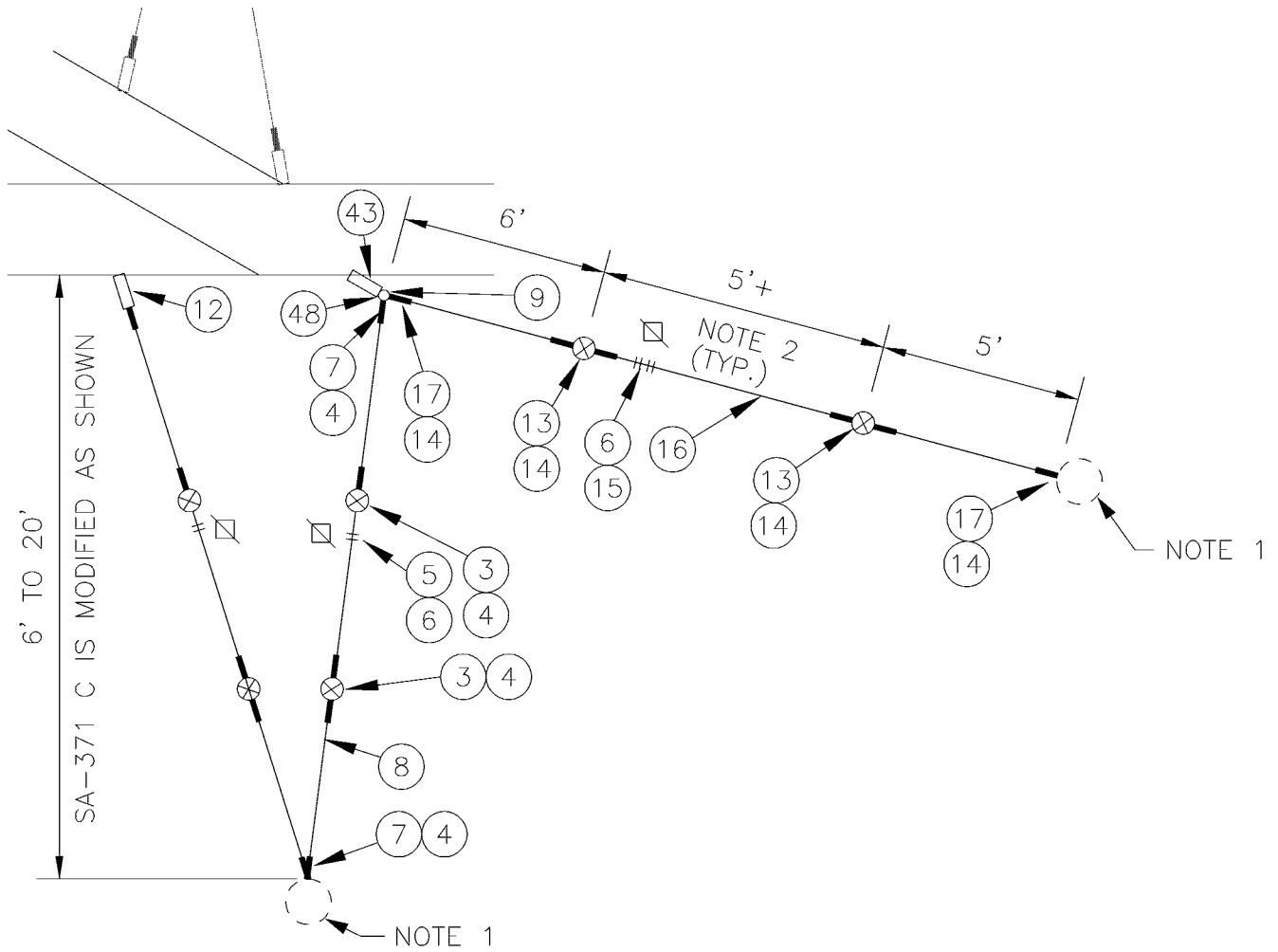
SA-371

SHT 6 OF 9



DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SWITCH PULLOFFS	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-371
APPROVED				SHT 7 OF 9

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SA-371H

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

SWITCH
PULLOFFS

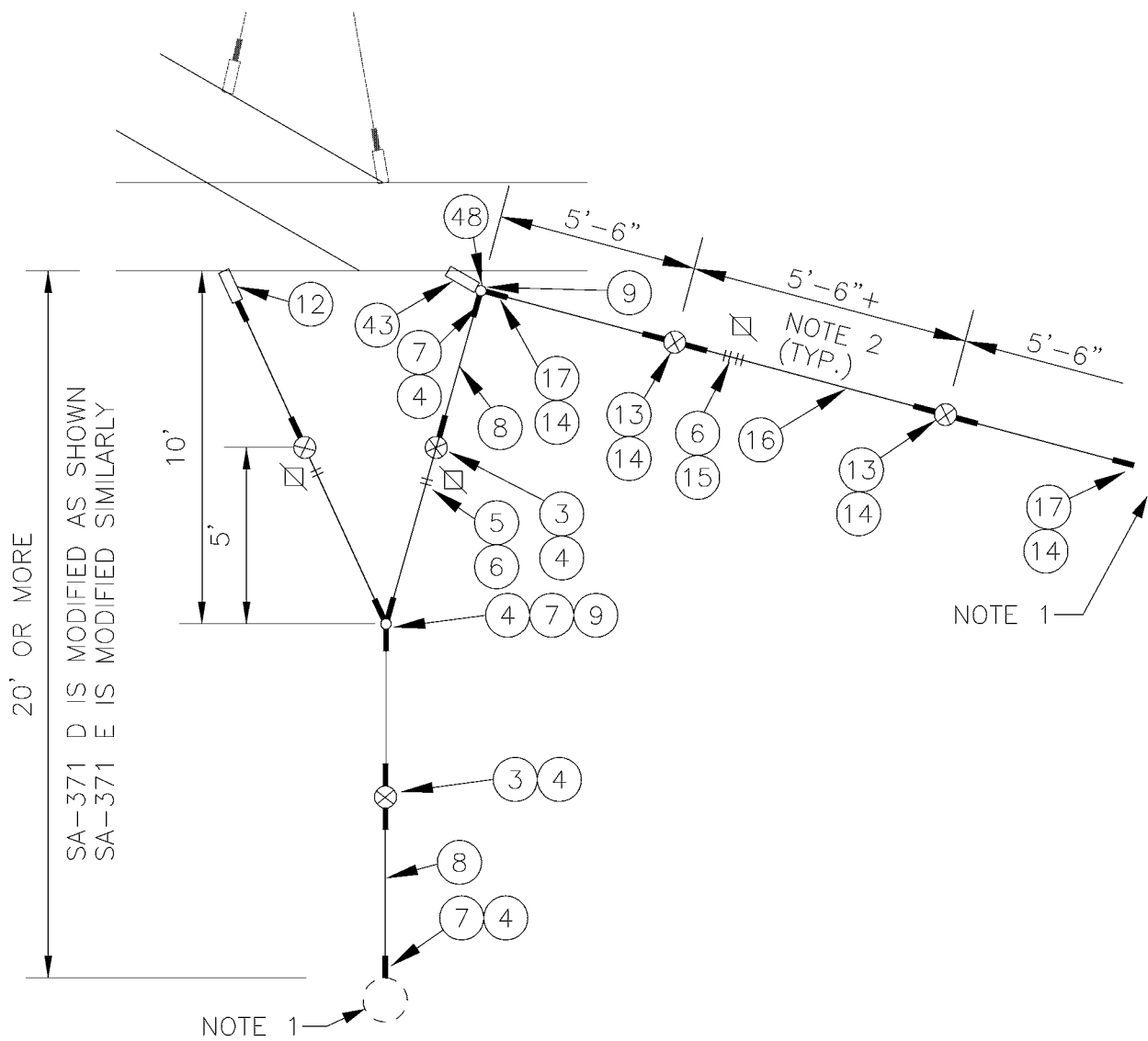
DATE:
JUN 95

FILE

DWG. NO.

SA-371

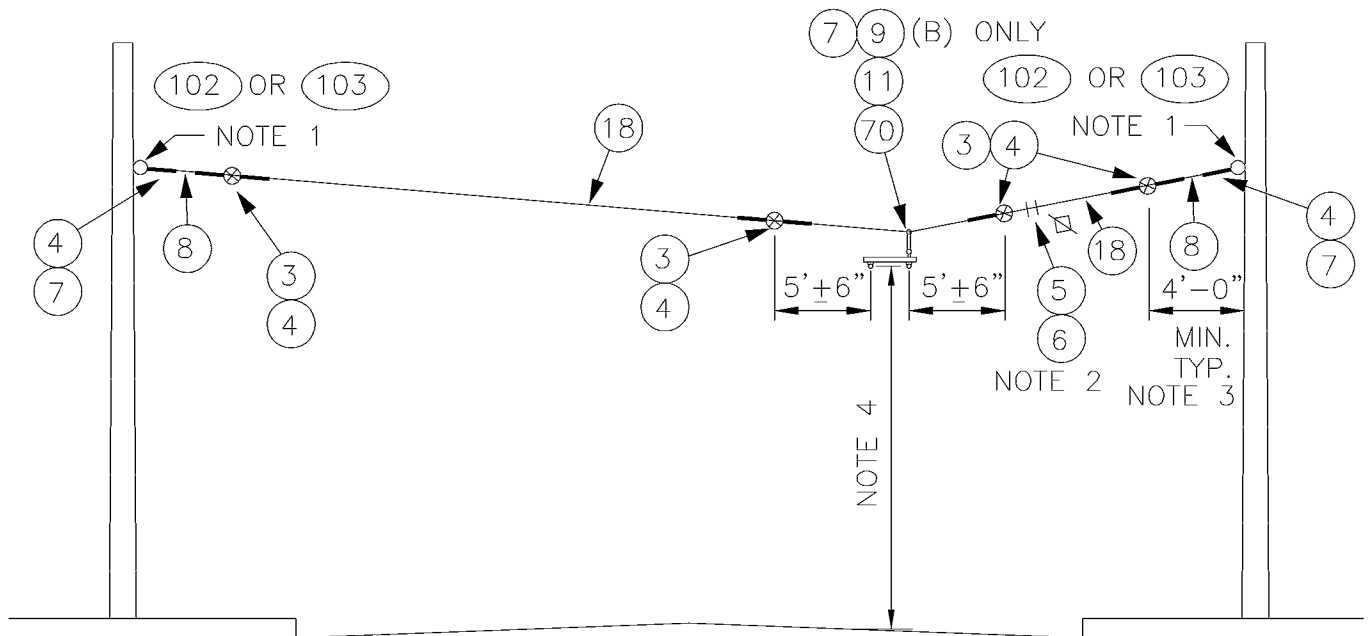
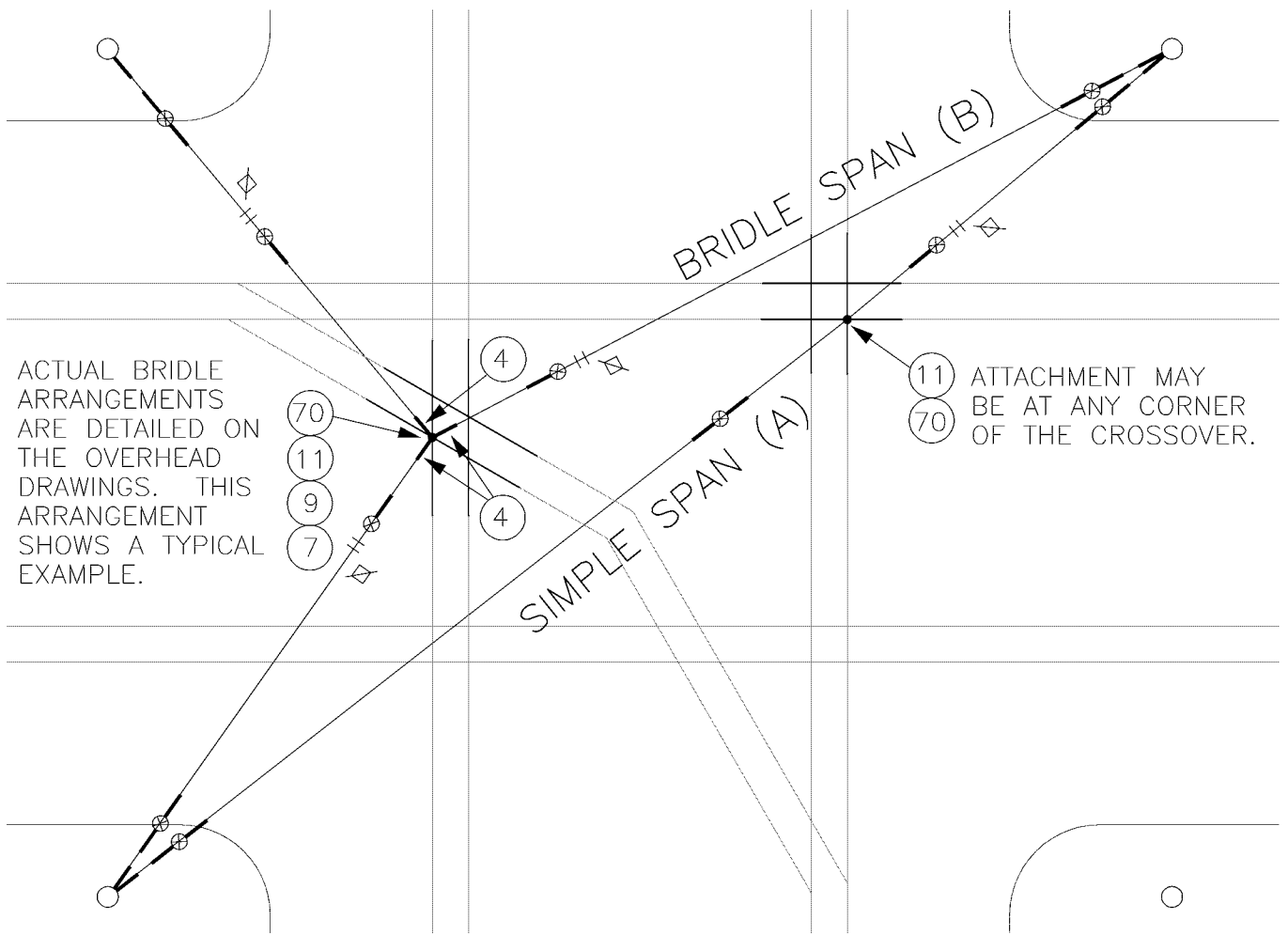
SHT 8 OF 9



SA-371J

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS SWITCH PULLOFFS	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-371
APPROVED				SHT 9 OF 9

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DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

CROSSOVER HOLDUP
SIMPLE SPAN (A)
BRIDLE SPAN (B)

DATE:

JUN 95

FILE

DWG. NO.

SA-372

SHT 1 OF 2

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. SEE SA-370 FOR LIMITED SPACE VARIANCES. SEE SA-167 FOR INSULATED GUY CRITERIA.
4. SEE SA-164 FOR VERTICAL & HORIZONTAL DIMENSIONS TO TROLLEY WIRE.

MATERIAL LIST (A)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	4	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	9	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
18	VARIES	GUY STRAND, COVERED	COPPERWELD	8MI
70	1	EYEBOLT, 5/8" X 6" W/2 NUTS & LOCKWASHER		
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

MATERIAL LIST (B)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	6	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	15	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	6	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	6	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	1	BULL RING	WABCO	18567-2000
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
18	VARIES	GUY STRAND, COVERED	COPPERWELD	8MI
70	1	EYEBOLT, 5/8" X 6" W/2 NUTS & LOCKWASHER		
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

CROSSOVER HOLDUP SPAN
NOTES & MATERIAL

DATE:

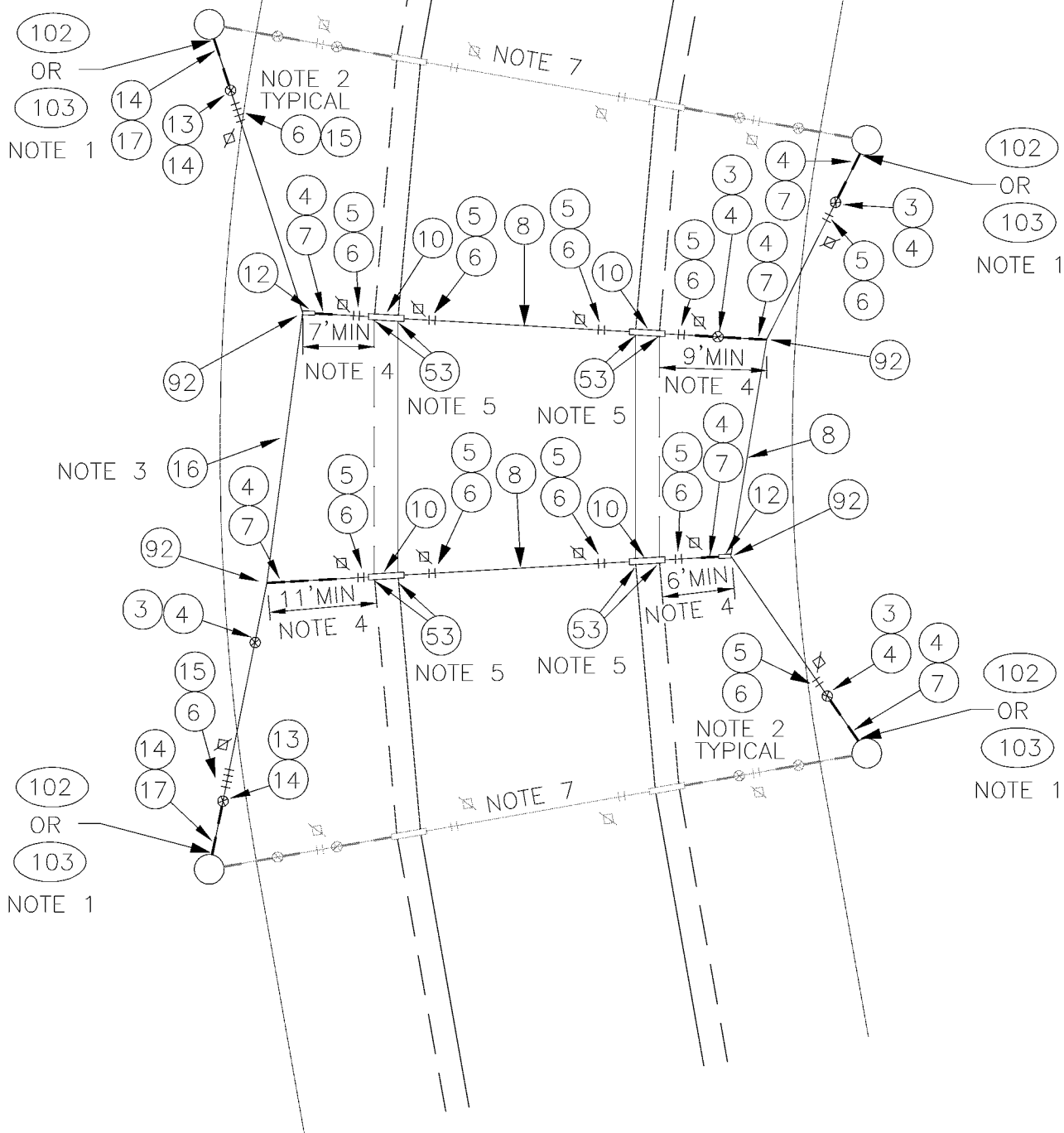
OCT 95

FILE

DWG. NO.

SA-372

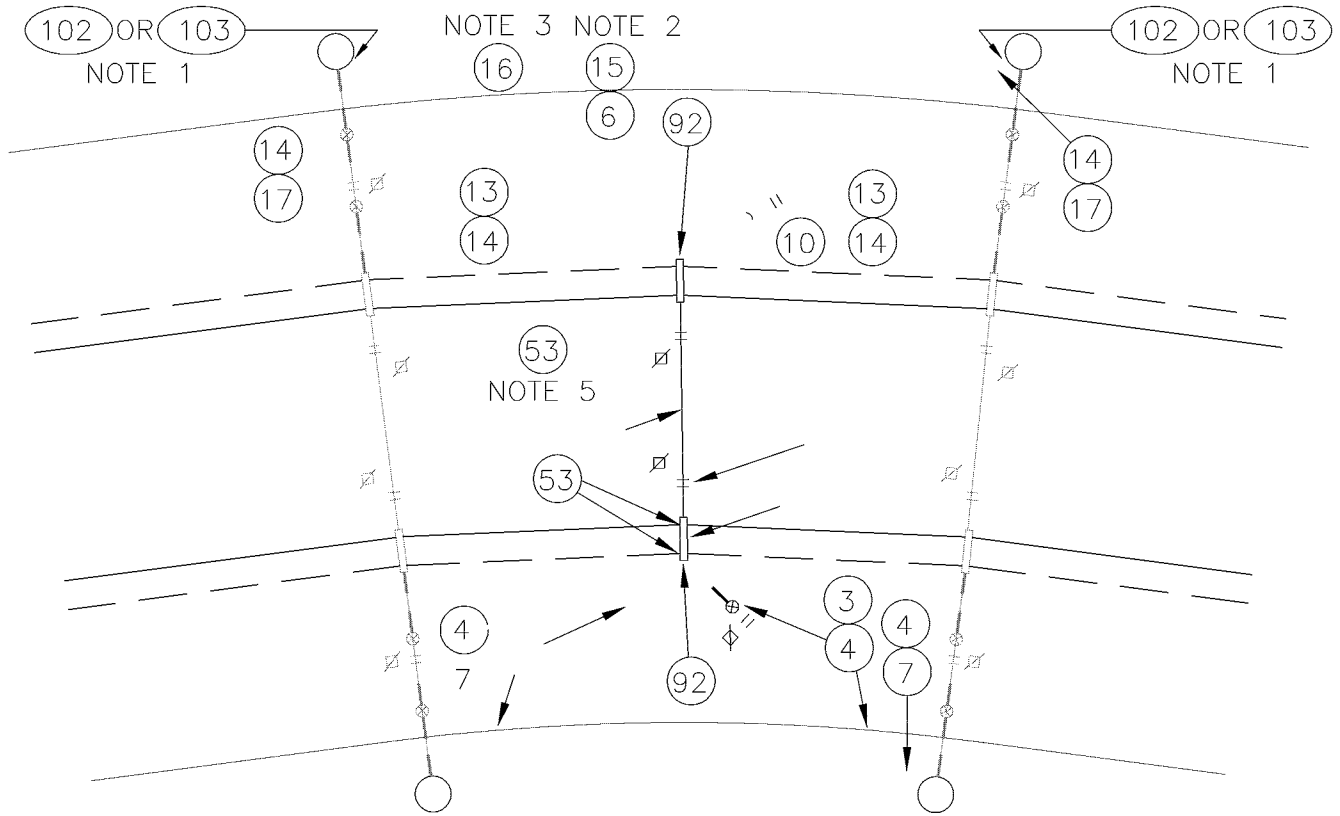
SHT 2 OF 2



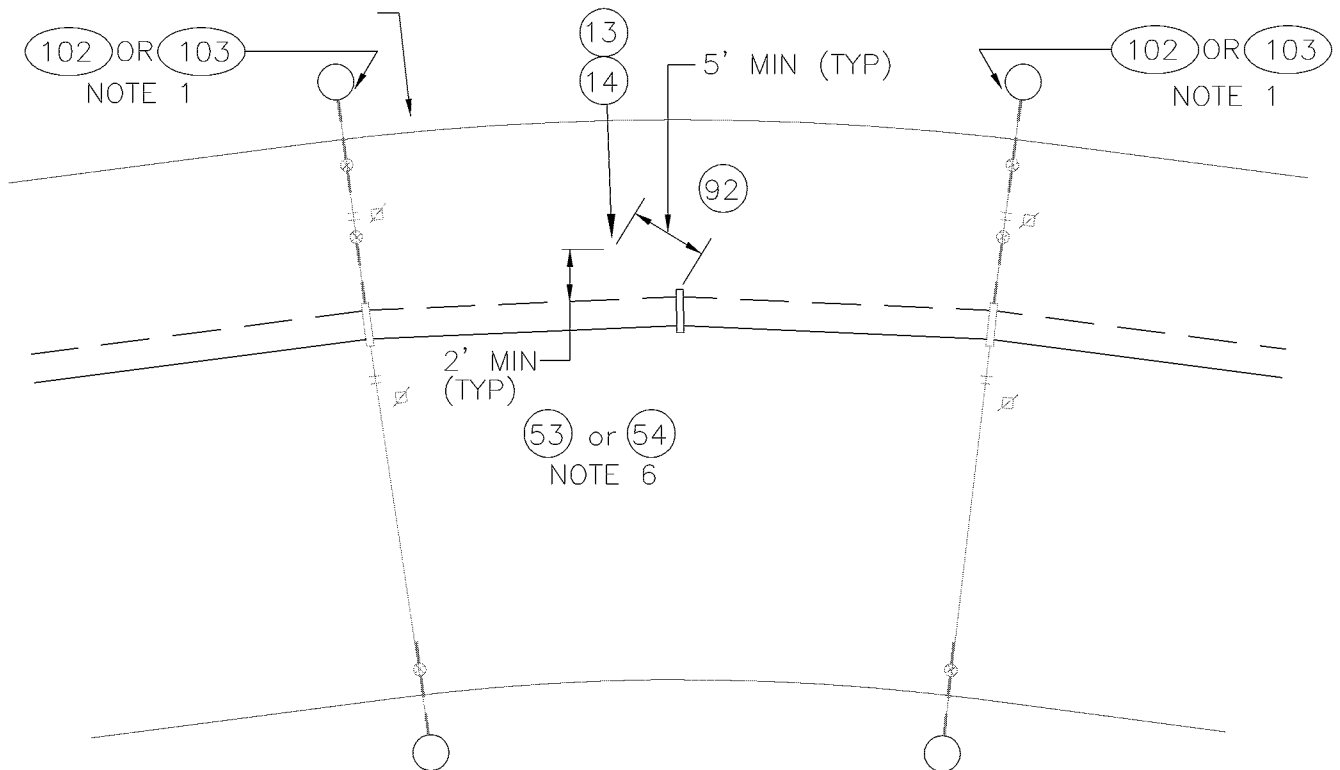
MULTI RAIL CURVE TWO WAY TRAFFIC

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DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: MAY 97
DR: DOW	SCALE: NONE		CONVENTIONAL CURVE WITH CURVE RAILS	FILE
RECOM.	CONTRACT:			DWG. NO. SA-373
APPROVED				SHT 1 OF 4



SINGLE CURVE RAIL TWO WAY TRAFFIC



SINGLE CURVE RAIL ONE WAY TRAFFIC

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DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS CONVENTIONAL CURVE WITH CURVE RAILS	DATE: JUN 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-373
APPROVED				SHT 3 OF 4

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	VARIES	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	VARIES	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
13	VARIES	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	VARIES	WIRE ROPE CLIP, 3/8"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M
17	VARIES	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
53	VARIES	CURVE RAIL (1° TO 5° 2 FT LG)	K & M	851 B412/0
54	VARIES	CURVE RAIL (>5° TO 7.5° 4 FT LG)	K & M	851 B412/1
92	VARIES	ANGLE CLAMP, DUCTILE IRON	ANDERSON/ SQUARE D	82860-2000
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "N". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. IF LOAD SHOWN ON OVERHEAD DRAWINGS IS LESS THAN 2500 LBS, THEN ITEM 8 MAY BE USED INSTEAD OF ITEM 16. THE ASSOCIATED ITEMS SHALL ALSO BE CHANGED I.E. 3 FOR 13, 4 FOR 14, 5 FOR 15 AND 7 FOR 17.

THE DISTANCE FROM THE TROLLEY WIRE TO THE SUPPORT CATENARY WIRE SHALL BE AS SHOWN ON THE OVERHEAD DRAWINGS. THE DISTANCES ON SA-373 ARE SHOWN TO DEFINE PARTS REQUIRED FOR DISTANCE RANGES ONLY.

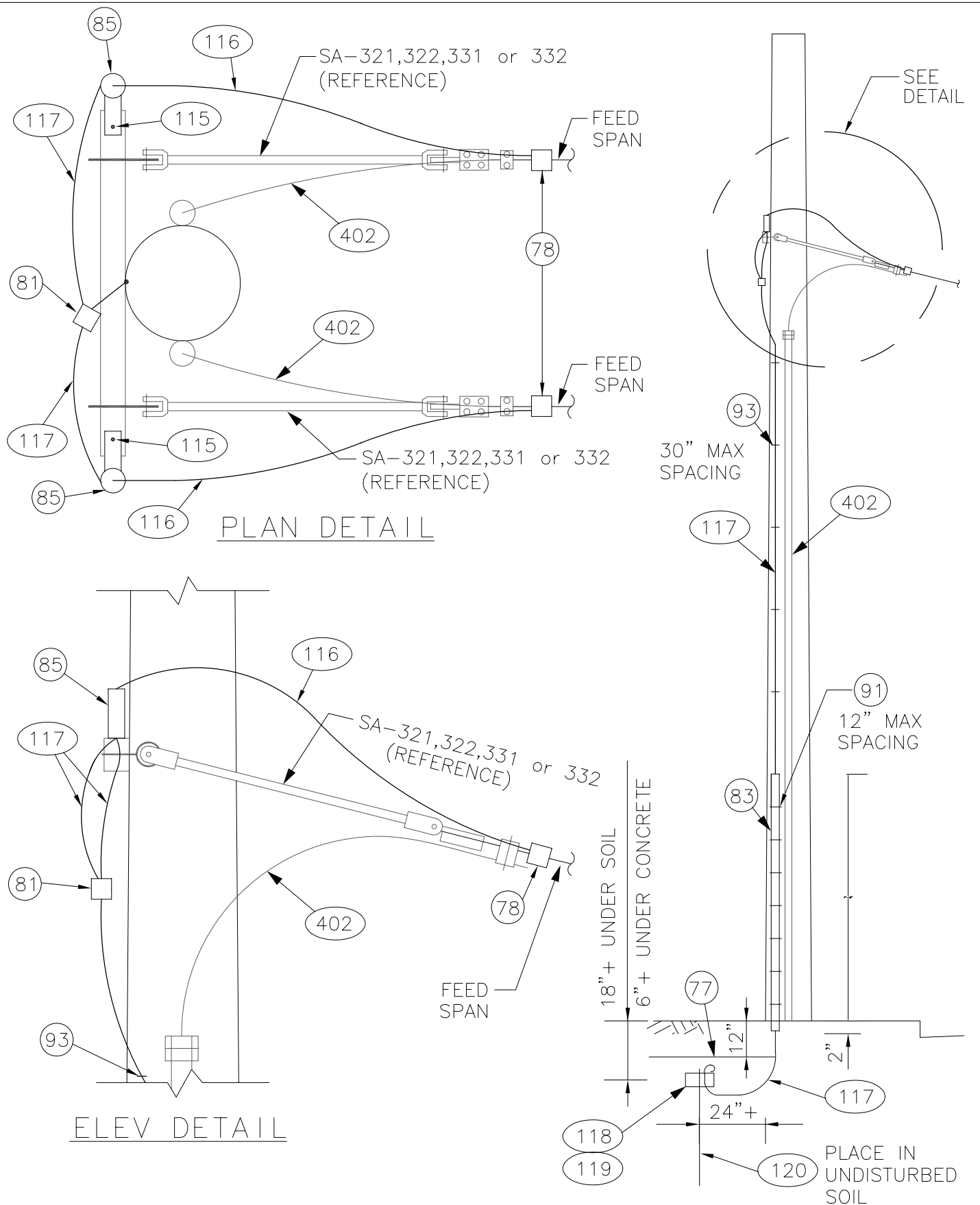
ANGLE VARIES FROM 1° TO 5°.

USE ITEM 53 WHEN ANGLE VARIES FROM 1° TO 5°. USE ITEM 54 WHEN ANGLE VARIES FROM 5° TO 7.5°. TROLLEY WIRE SHALL NOT BE TIED TOGETHER AS SHOWN ON SHEET 1 WHEN USING ITEM 54. USE SHEET 2, IF TWO WAY TROLLEY WIRE USES ITEM 54, AND TREAT EACH TRACK SEPARATELY.

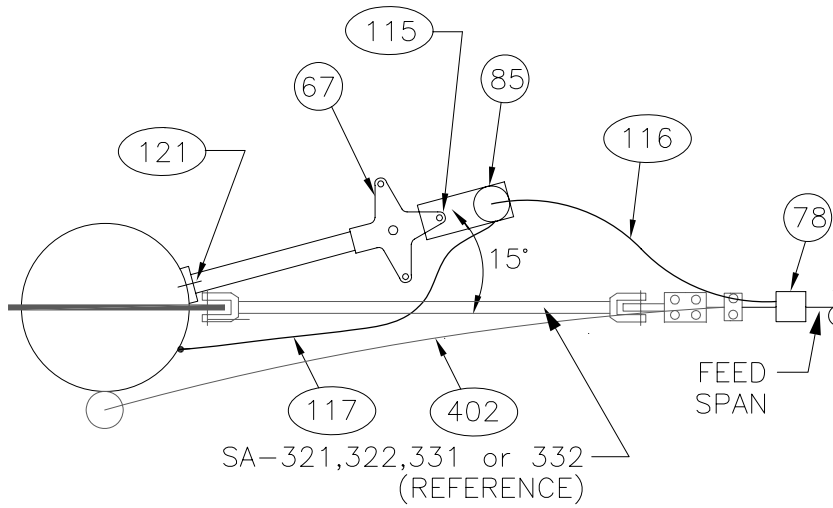
END SPAN SHOWN FOR REFERENCE ONLY, ACTUAL SPAN USED SHALL BE DEFINED ON THE OVERHEAD DRAWINGS.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS CONVENTIONAL CURVE WITH CURVE RAILS	DATE: OCT 95
DESIGNED MB	SCALE: NONE			FILE
REVISIONS	CONTRACT:			DWG. NO. SA-373
APPROVED				SHT 4 OF 4

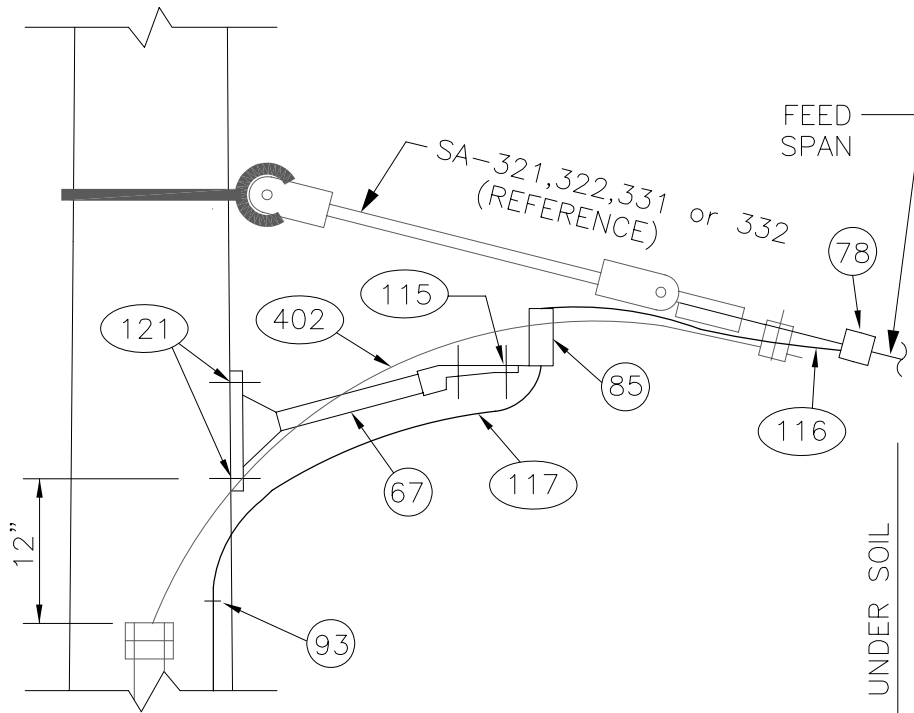
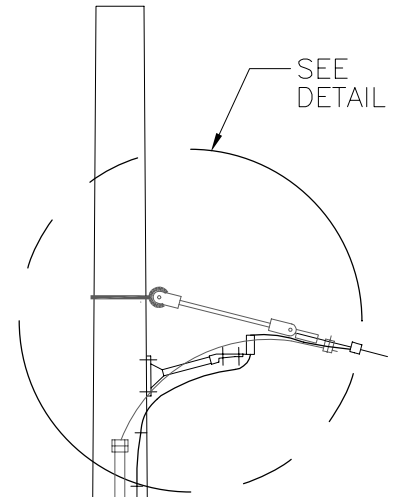
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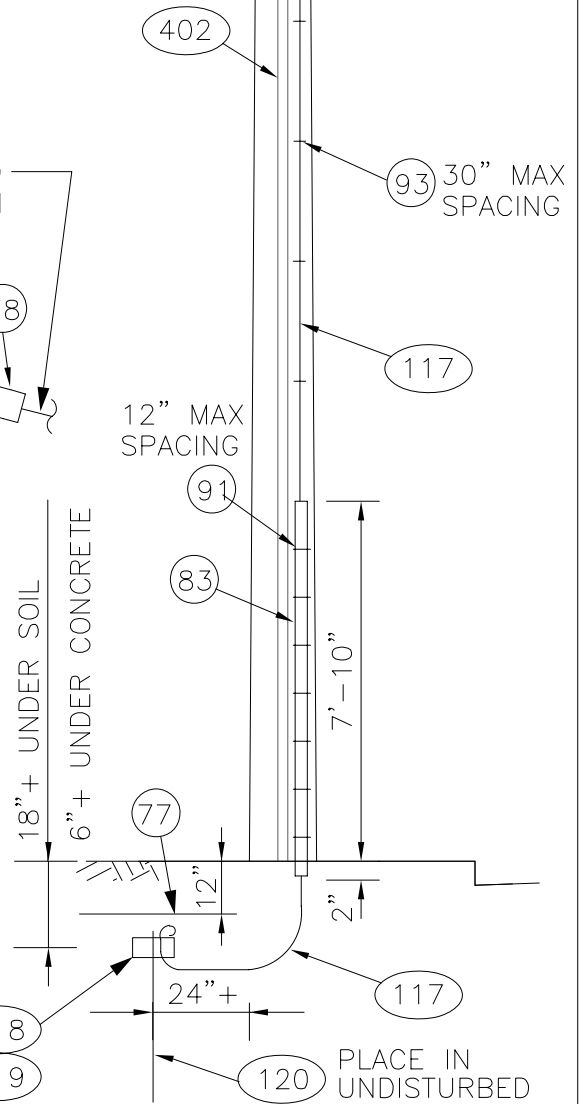
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS LIGHTNING ARRESTERS DOUBLE FEEDER RISER (WOOD POLE)	DATE: FEB 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-401
APPROVED				SHT 1 OF 6



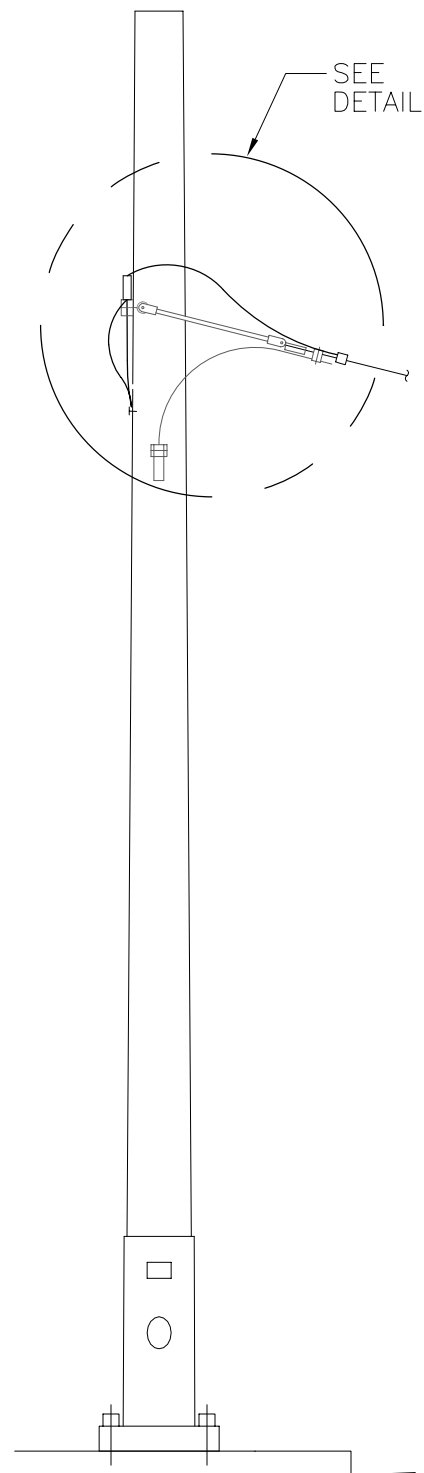
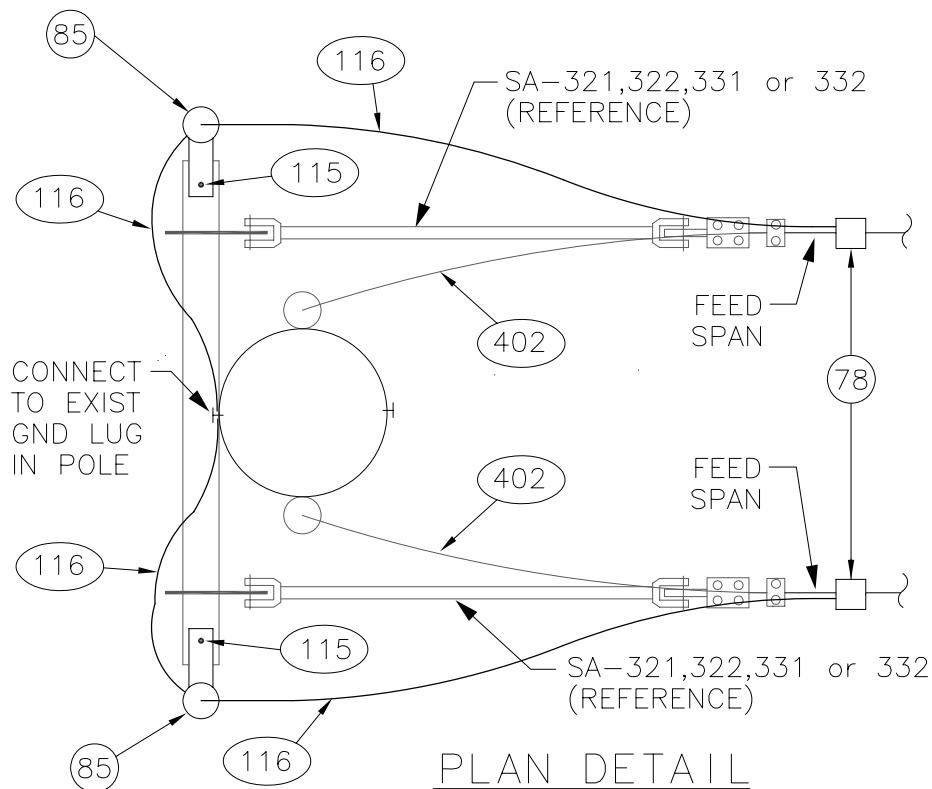
PLAN DETAIL



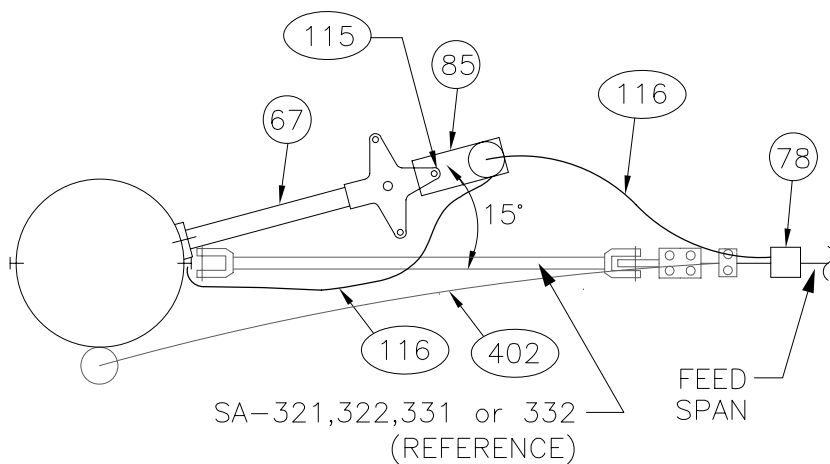
ELEV DETAIL



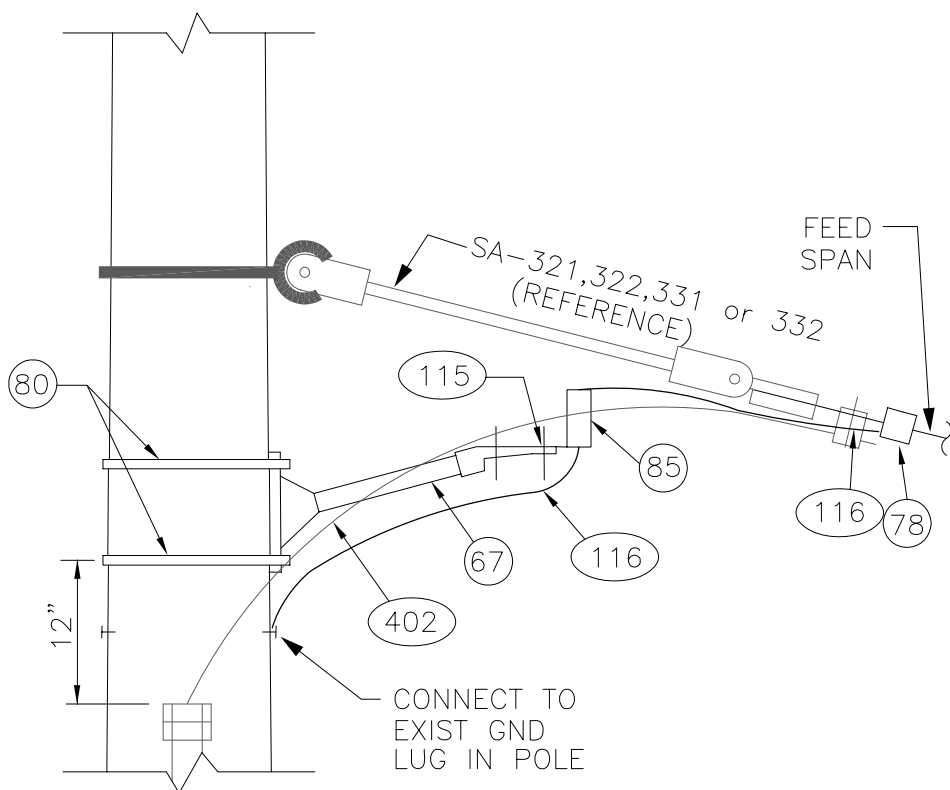
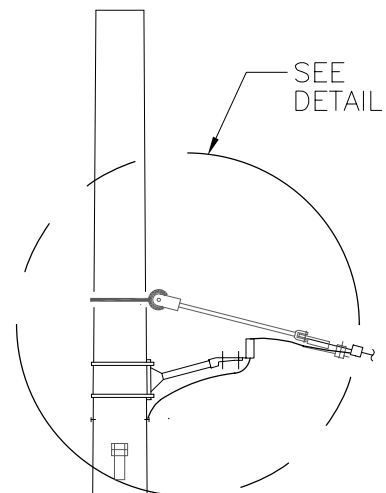
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS LIGHTNING ARRESTER SINGLE FEEDER RISER (WOOD POLE)	DATE: MAY 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-401
APPROVED				SHT 2 OF 6



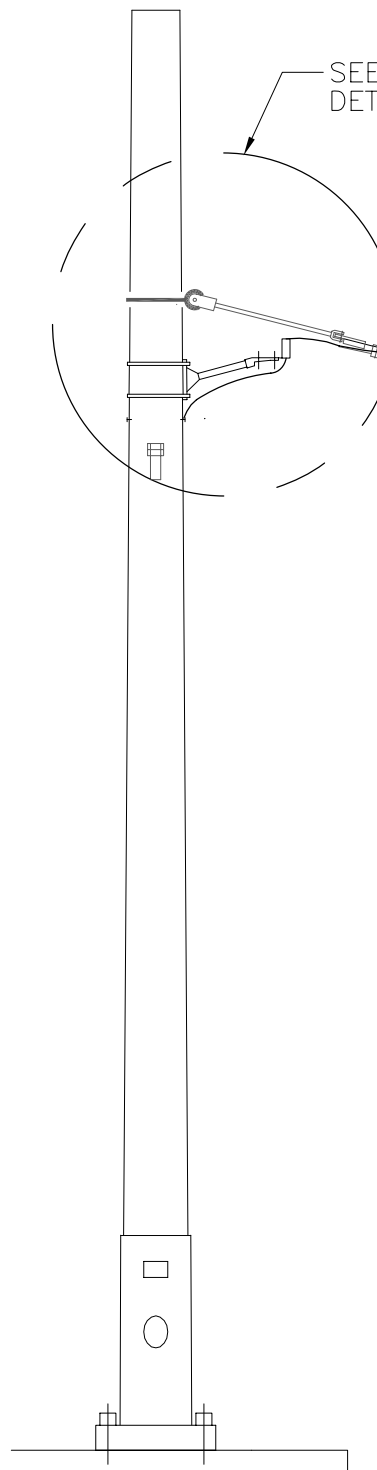
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS LIGHTNING ARRESTERS DOUBLE FEEDER RISER (STEEL POLE)	DATE: JUN 95
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-401
APPROVED				SHT 3 OF 6



PLAN DETAIL



ELEV DETAIL



DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS	DATE: JUN 95
DR: MM	SCALE: NONE		LIGHTNING ARRESTERS SINGLE FEEDER RISER (STEEL POLE)	FILE
RECOM.	CONTRACT:			DWG. NO. SA-401
APPROVED				SHT 4 OF 6

WOOD POLE SINGLE FEEDER MATERIAL LIST (SEE PAGE 2)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
67	1	CLOVERLEAF EPOXIROD STANDOFF	CHANCE	C653-1038
77	AS REQD	ELEC WARNING TAPE, 6" YELLOW	BRADY	UT 20-Y6
78	1	CONNECTOR, PARALLEL CLAMP	BURNDY	QPX342C
83	1	MOLDING, PLASTIC, GROUND WIRE, 1/2" X 1/16" X 8'	JOSLYN	PM128
85	1	1000 VOLT DC ARRESTOR 970 MCOV	IMPULSE	P/N 1057
91	AS REQD	STAPLES, ROLLED POINT, GALV, 2" X 1/2" X 0.162"	JOSLYN	J156
93	AS REQD	STAPLES, ROLLED POINT, GALV, 1 3/4" X 1/4" X 0.148"	JOSLYN	J1673
115	1	STAINLESS STEEL BOLT WITH WASHERS & LOCK WASHERS		
116	*	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		
117	VARIES	WIRE, #6 AWG CU, SOLID, SOFT, 0.031" POLYETHYLENE INSULATED		
118	1	GROUND ROD CLAMP	COPPERWELD	ABH58
119	AS REQD	CONDUCTIVE & ANTI-SEIZE COMPOUND (KOPR-SHIELD)	THOMAS & BETTS	CP-8 OR CP-16
120	1	GROUND ROD, 5/8" X 10'	COPPERWELD OR JOSLYN	GR5810 J8340
121	2	LAG SCREW, FETTER DRIVE, 5/8" X 5"	JOSLYN	J8765
402	AS REQD	FEEDER RISER	METRO STD	SA-402

STEEL POLE SINGLE FEEDER MATERIAL LIST (SEE PAGE 4)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
67	1	CLOVERLEAF EPOXIROD STANDOFF	CHANCE	C653-1038
78	1	CONNECTOR, PARALLEL CLAMP	BURNDY	QPX342C
80	AS REQD	3/4" X 0.030" SS BANDING TYPE 201	BAND-IT	C206
85	1	1000 VOLT DC ARRESTOR 970 MCOV	IMPULSE	P/N 1057
115	1	STAINLESS STEEL BOLT WITH WASHERS & LOCK WASHERS		
116	*	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		
402	AS REQD	FEEDER RISER	METRO STD	SA-402

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS LIGHTNING ARRESTER SINGLE FEEDER RISER MATERIAL LIST	DATE: MAY 98
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-401
APPROVED				SHT 5 OF 6

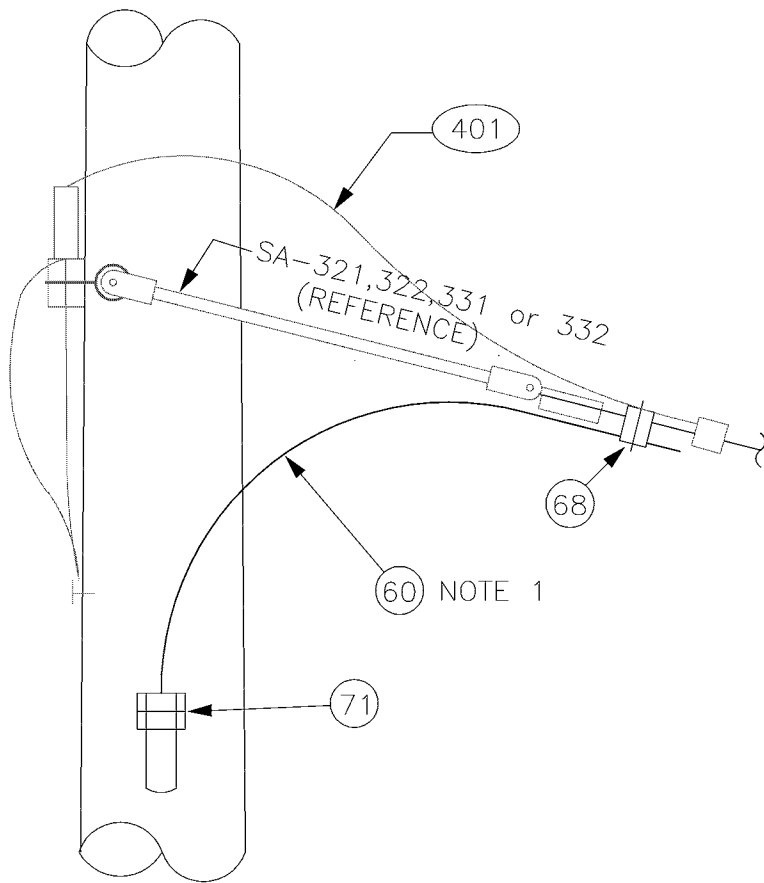
WOOD POLE DOUBLE FEEDER MATERIAL LIST (SEE PAGE 1)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
77	AS REQD	ELEC WARNING TAPE, 6" YELLOW	BRADY	UT 20-Y6
78	2	CONNECTOR, PARALLEL CLAMP	BURNDY	QPX342C
81	1	CONNECTOR, SERVICE, SPLIT BOLT	BURNDY	KS20
83	1	MOLDING, PLASTIC, GROUND WIRE, 1/2" X 1/16" X 8'	JOSLYN	PM128
85	2	1000 VOLT DC ARRESTOR 970 MCOV	IMPULSE	P/N 1057
91	AS REQD	STAPLES, ROLLED POINT, GALV, 2" X 1/2" X 0.162"	JOSLYN	J156
93	AS REQD	STAPLES, ROLLED POINT, GALV, 1 3/4" X 1/4" X 0.148"	JOSLYN	J1673
115	2	STAINLESS STEEL BOLT WITH WASHERS & LOCK WASHERS		
116	*	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		
117	VARIES	WIRE, #6 AWG CU, SOLID, SOFT, 0.031" POLYETHYLENE INSULATED		
118	1	GROUND ROD CLAMP	COPPERWELD	ABH58
119	AS REQD	CONDUCTIVE & ANTI-SEIZE COMPOUND (KOPR-SHIELD)	THOMAS & BETTS	CP-8 OR CP-16
120	1	GROUND ROD, 5/8" X 10'	COPPERWELD OR JOSLYN	GR5810 J8340
402	AS REQD	FEEDER RISER	METRO STD	SA-402

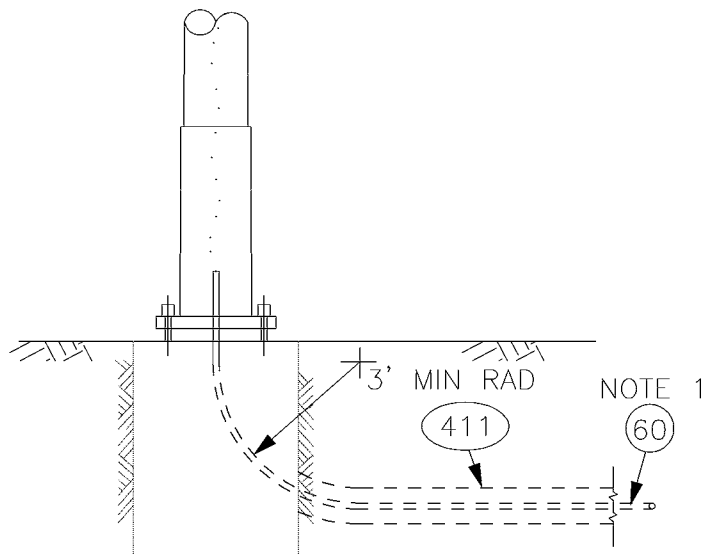
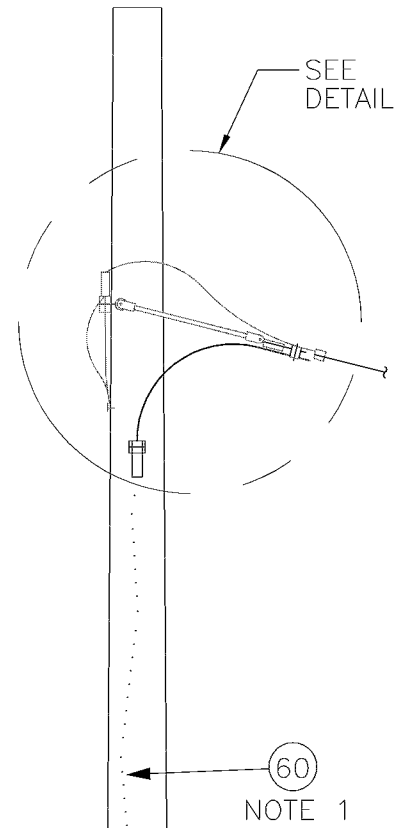
STEEL POLE DOUBLE FEEDER MATERIAL LIST (SEE PAGE 3)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
78	2	CONNECTOR, PARALLEL CLAMP	BURNDY	QPX342C
85	2	1000 VOLT DC ARRESTOR 970 MCOV	IMPULSE	P/N 1057
115	2	STAINLESS STEEL BOLT WITH WASHERS & LOCK WASHERS		
116	*	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		
402	AS REQD	FEEDER RISER	METRO STD	SA-402

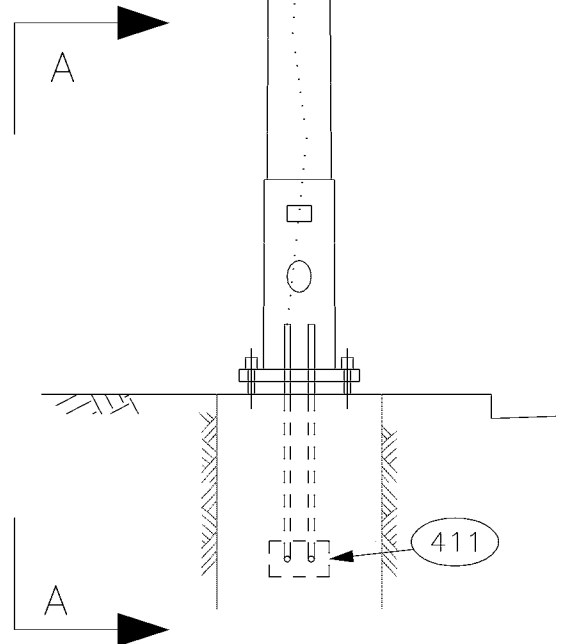
DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS LIGHTNING ARRESTER DOUBLE FEEDER MATERIAL LIST	DATE: MAR 97
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-401
APPROVED				SHT 6 OF 6



ELEV DETAIL

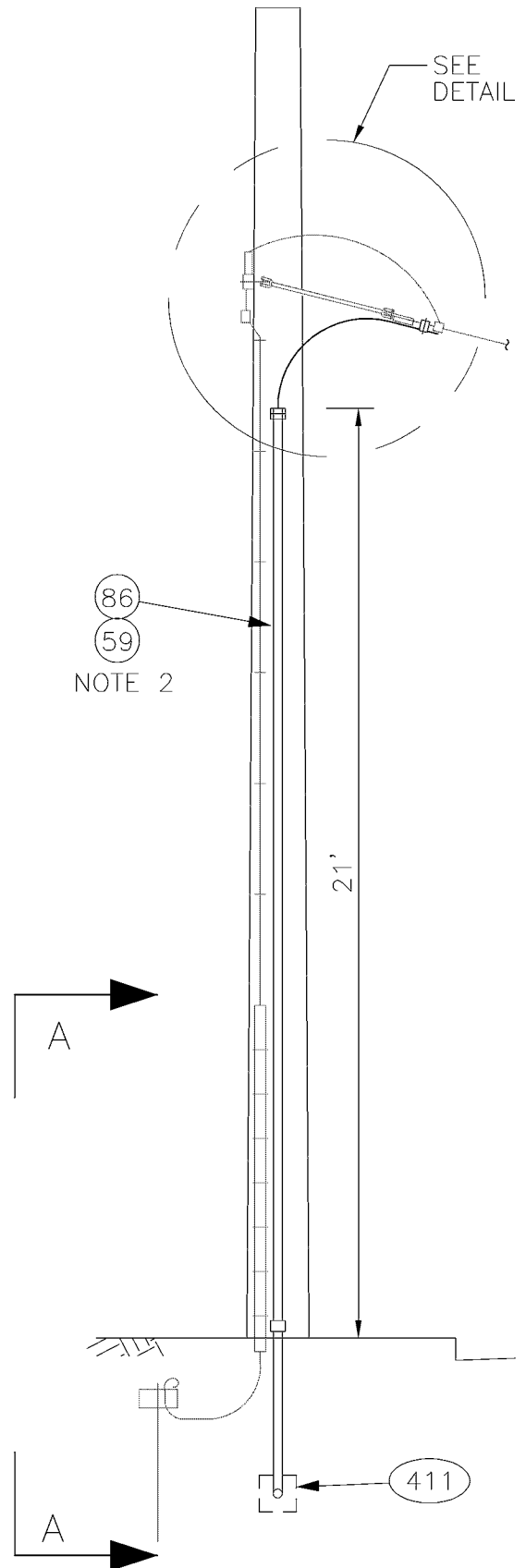
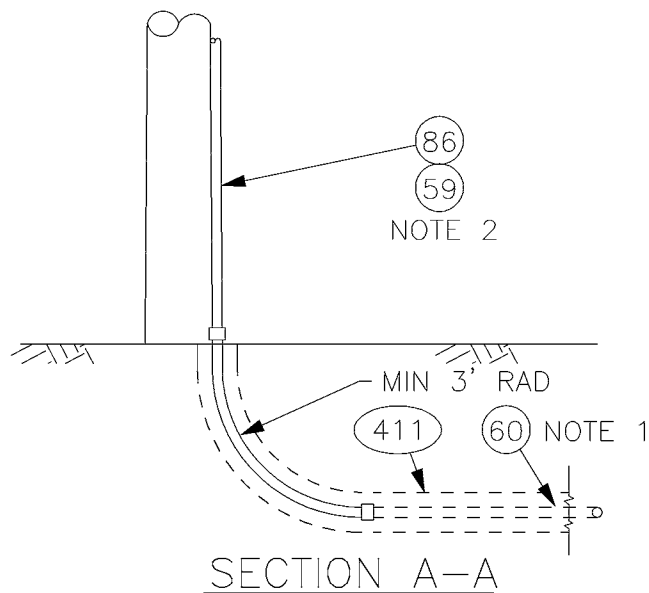
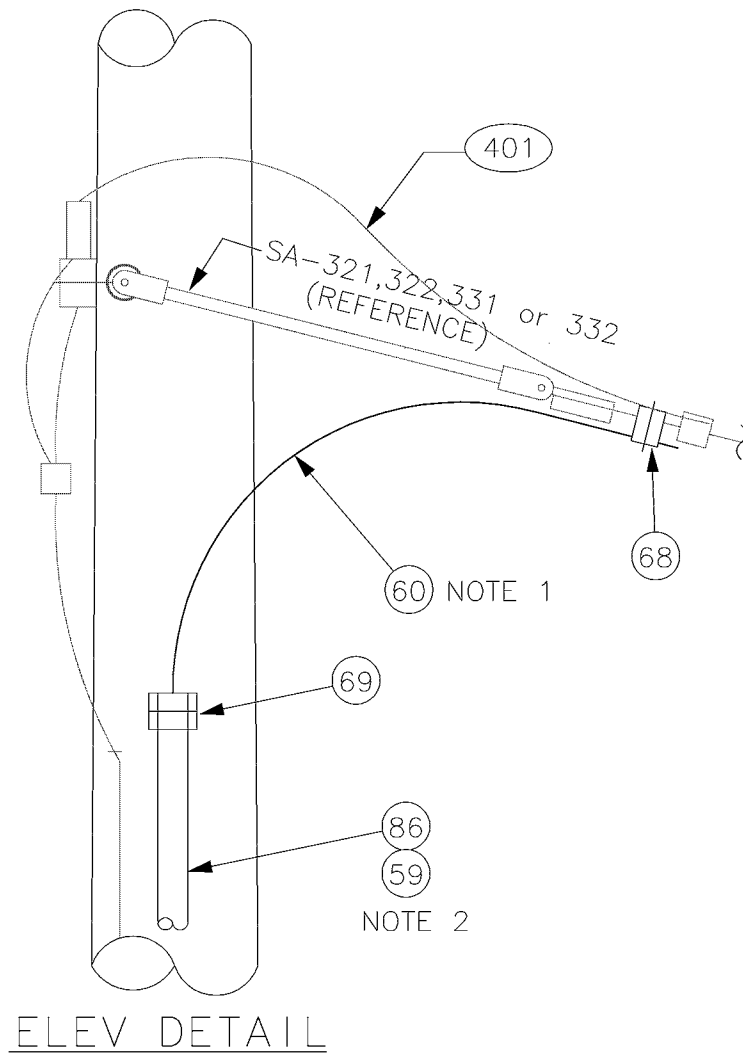


SECTION A-A



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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS FEEDER RISER (STEEL POLE)	DATE: JUN 95
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-402
APPROVED				SHT 1 OF 3



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DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

FEEDER RISER
(WOOD POLE)

DATE:
JUN 95

FILE

DWG. NO.
SA-402

SHT 2 OF 3

STEEL POLE MATERIAL LIST (SEE PAGE 1)

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UN-SHIELDED, 5 KV EPR W/ PVC JACKET		
68	1 or 2	UNIVERSAL SERVICE CONNECTOR	BURNDY	KVSU 34
71	1 or 2	WATERTIGHT STR STRAIN RELIEF CONN 1 1/2" CONDUIT	O-Z-GEDNEY	SR 15012 H. D. GALV.
401	AS REQD	LIGHTNING ARRESTER	METRO STD	SA-401
411	AS REQD	DUCTBANK	METRO STD	SA-411

WOOD POLE MATERIAL LIST (SEE PAGE 2)

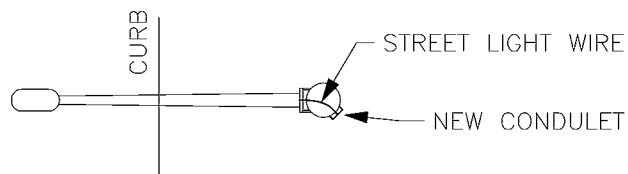
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
59	AS REQD	CONDUIT CLAMP W/2" MTG SCREW		
60	AS REQD	FEED SPAN CABLE 500 KCM CU, UN-SHIELDED, 5 KV EPR W/ PVC JACKET		
68	1 or 2	UNIVERSAL SERVICE CONNECTOR	BURNDY	KVSU 34
69	1 or 2	SEALING BUSHING, TYPE KR W/ TYPE M CABLE SUPPORT 2-1/2" CONDUIT	O-Z-GEDNEY	KR250 & RPLG-2001-1
86	AS REQD	GALV RIGID STEEL CONDUIT		
401	AS REQD	LIGHTNING ARRESTER	METRO STD	SA-401
411	AS REQD	DUCTBANK	METRO STD	SA-411

NOTES:

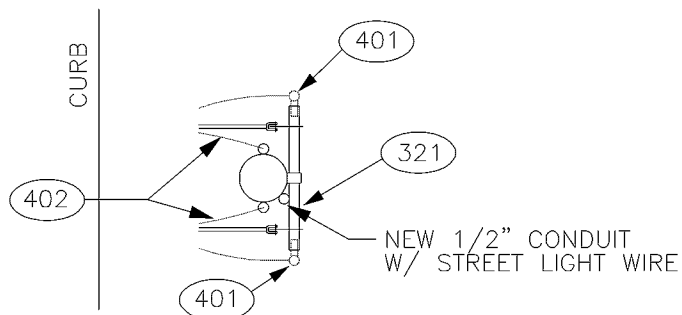
- ITEM 60 SHALL INCLUDE SUFFICIENT LENGTH TO CONNECT FEED SPAN WITH VAULT SHOWN ON DRAWINGS. COIL 20' AT VAULT END, AND COIL 10' AT FEED SPAN END.
- ITEMS 59 & 86 TO MEET REQUIREMENTS OF SEATTLE CITY LIGHT SPEC U7-10. SINGLE RISER IS SHOWN, A SECOND CONDUIT SHALL BE ADDED FOR DOUBLE FEED RISER.
- ITEM 86 & 411 CONDUIT TO BE PLASTIC COATED GALV RIGID STEEL IN BENDS.

DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS FEEDER RISER MATERIAL LIST	DATE: JUN 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-402
APPROVED				SHT 3 OF 3

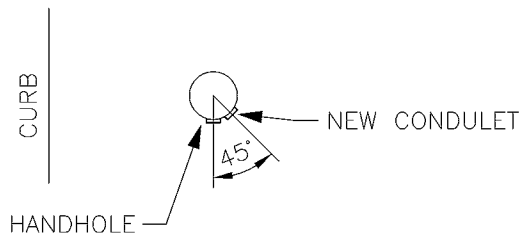
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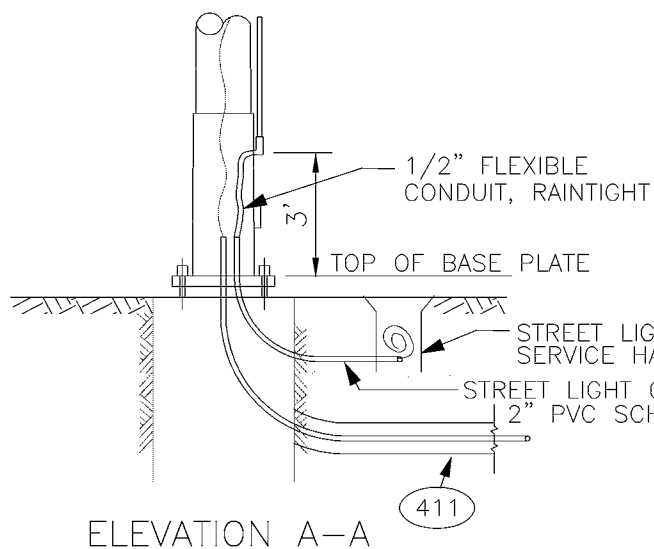
PLAN D-D



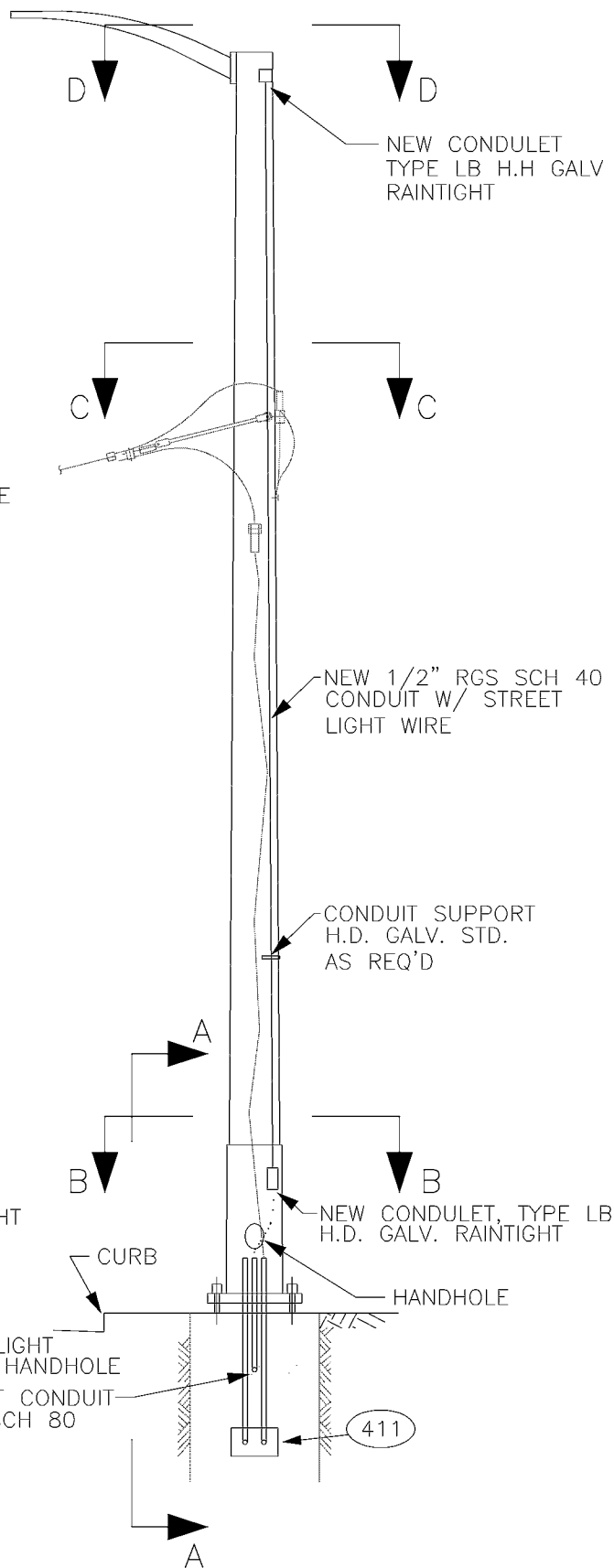
PLAN C-C



PLAN B-B



ELEVATION A-A



DESIGNED
DPG

CHKD:
DOW

DR:
MM

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

STEEL POLE FEEDER RISER
WITH STREETLIGHT
SPECIAL DETAILS

DATE:
MAY 96

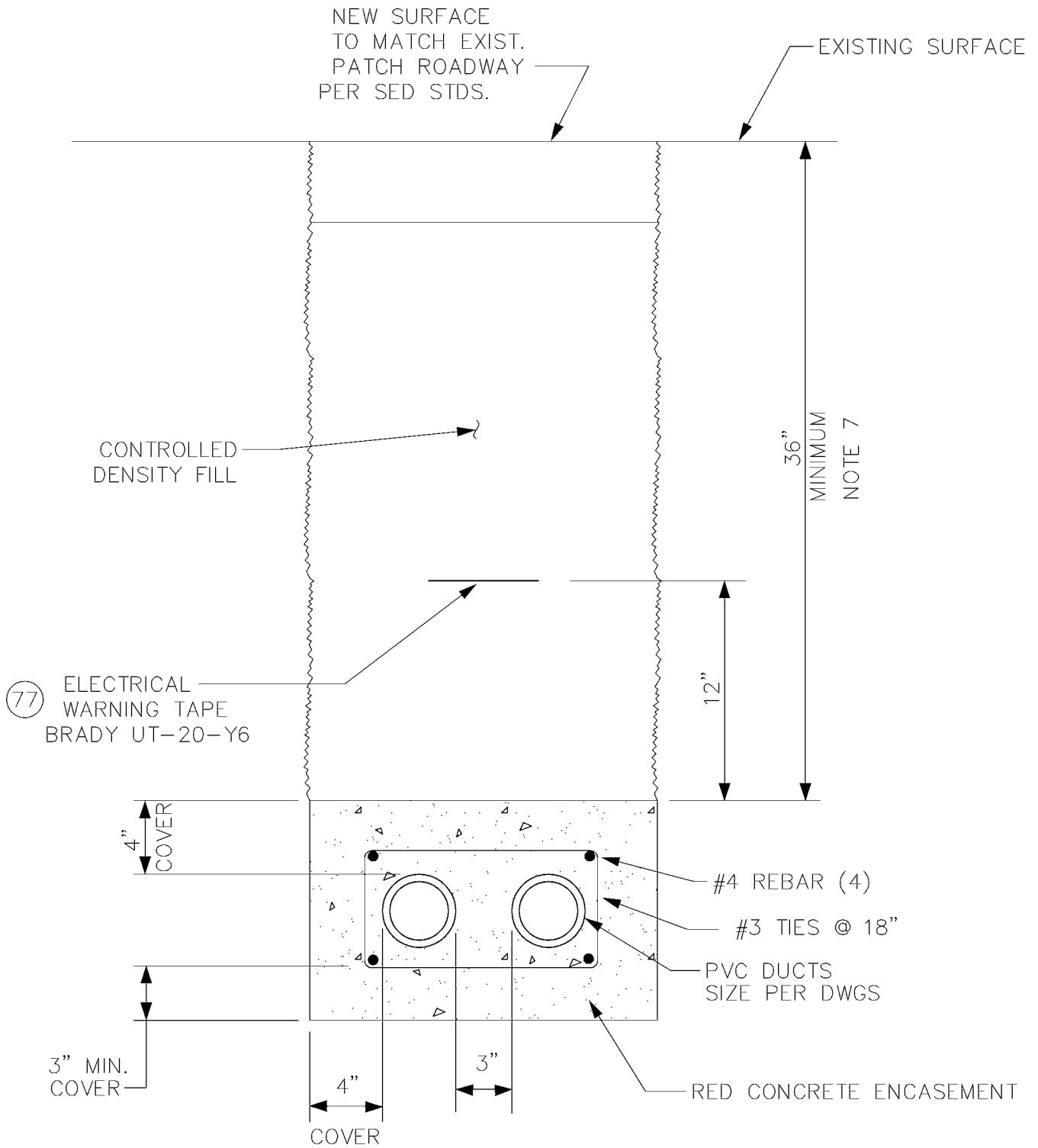
FILE

DWG. NO.

SA-403

SHT 1 OF 1

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CONCRETE ENCASED DUCTBANK

SCALE: NOT TO SCALE

DESIGNED
DPG

CHKD:
MB

DR:
DOW

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
TROLLEY STANDARDS

DUCTBANK
CONCRETE ENCASED

DATE:

JUN 95

FILE

DWG. NO.

SA-411

SHT


1 OF 2

NOTES:

1. PVC conduit, fittings, and solvent shall meet the requirements of USDC Commercial Standard CS 207, UL 651, ASTM 2564, NEMA TC2, NEMA TC6 & NEMA TC9.
2. All work shall meet the requirements of City of Seattle Board of Public Works Rules: Chapter 4.40 – Street and Sidewalk Pavement Opening and Restoration Rules if duct is in Street Right of Way.
3. Concrete for duct shall develop a minimum compressive strength of 3000 PSI at 28 days, and shall be colored red by adding ten pounds of iron oxide per cubic yard of concrete. Max. aggregate size shall be 3/8”.
4. All reinforcing bars shall be deformed billet steel and shall meet the requirements of ASTM A615 Grade 60. All detailing of reinforcement shall meet the requirements of the MANUAL OF STANDARD PRACTICE For Detailing Reinforced Concrete Structures ACI-315 current edition.
5. Compacted trench backfill shall be suitable excavated native material, that is acceptable to the engineer. Backfill shall be firmly and thoroughly machine tamped to 95% maximum dry density under streets or sidewalks, and 90% maximum dry density under landscaped or unimproved areas.
6. Pavement patching shall meet the requirements of City of Seattle Department of Engineering Standard Plan No. 404A, if the duct is in street.
7. Burial depth shall be 48” minimum at street intersections (maximum depth shall be 72”). Maximum grade shall be 10%. Minimum grade shall be 0.25%.
8. Plastic coated GRS conduit shall be used to accomodate horizontal direction changes greater than 15°. The sweep shall be effected with a 12.5 ft minimum radius, and PVC adapter couplings as required. The

DESIGNED DPG	CHKD: MB	 King County	DEPARTMENT OF TRANSPORTATION TROLLEY STANDARDS DUCTBANK CONCRETE ENCASED	DATE: JUN 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-411
APPROVED				SHT 2 OF 2

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NUMBER		TITLE		SHEETS
SA-500		DRAWING INDEX		1
SA-501		MASTER MATERIAL LIST		3
SA-511		TANGENT SPAN		1
SA-515		BRIDLE SPAN		1
SA-541		STEEL POLE BRACKET ASSEMBLY TANGENT CONST		2
SA-542		STEEL POLE BRACKET ASSEMBLY CURVE CONST		2
SA-549		STEEL POLE TANGENT FEEDER BRACKET ASSEMBLY		3
SA-551		WOOD POLE BRACKET ASSEMBLY TANGENT CONST		2
SA-552		WOOD POLE BRACKET ASSEMBLY CURVE CONST		2
SA-553		CONCRETE ATTACHMENT BRACKET ASSEMBLY CURVE CONST		2
SA-557		WOOD POLE BRACKET ASSEMBLY CURVE CONST (2 TRACKS)		2
SA-559		WOOD POLE TANGENT FEEDER BRACKET ASSEMBLY		3
SA-571		SPECIALWORK PULLOFFS		5
SA-572		DEAD END ASSEMBLY		2
SA-590		TEMPORARY INSULATION BOARD		1
DESIGNED DPG	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR STANDARDS WATERFRONT STREETCAR DRAWING INDEX	DATE: 1 APR 95
DR: DOW	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-500
APPROVED				SHT 1 OF 1

MASTER MATERIAL LIST

ITEM #	METRO STANDARD SA- WHICH USES THE ITEM
01	511, 515, 571, 590
02	511, 515, 590
03	511, 515, 542, 549, 552, 553, 557, 559, 571, 572
04	511, 515, 542, 549, 552, 553, 557, 559, 571, 572
05	511, 515, 542, 552, 553, 557, 571, 572
06	511, 515, 542, 552, 553, 557, 571, 572
07	511, 515, 542, 549, 552, 553, 557, 559, 571, 572
08	511, 515, 542, 549, 552, 553, 557, 559, 571, 572
09	515, 571, 572
10	549, 559
11	542, 549, 552, 553, 557, 559, 572
12	542, 552, 553, 557, 571
13	572
14	572
15	572
16	572
17	541, 542, 549, 551, 552, 553, 557, 559, 572
18	*
19	*
20	*
21	*
22	*
23	*
24	*
25	*
26	*
27	*
28	541, 542, 551, 552, 553, 557
29	*
30	541, 551
31	541, 551
32	*
33	*
34	*
35	*
36	*
37	*
38	542, 552, 553, 557
39	*
40	571
41	549, 559
42	549, 559

DESIGNED
DPG

DR:
DOW

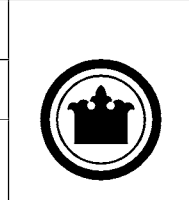
RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR STANDARDS

WFSC MASTER
MATERIAL LIST
USAGE REFERENCE

DATE:
FEB 98

FILE

DWG. NO.
SA-501

SHT 1 OF 3

MASTER MATERIAL LIST

ITEM #	METRO STANDARD SA- WHICH USES THE ITEM
43	*
44	542, 552, 553, 557
45	542, 552, 553, 557
46	571
47	542, 552, 553, 557, 571
48	*
49	549, 559
50	549, 559
51	549, 559
52	549, 559
53	542, 552, 553, 557
54	542, 552, 553, 557
55	541, 542, 549, 551, 552, 553, 557, 559
56	541, 542, 549, 551, 552, 553, 557, 559
57	541, 542, 549, 551, 552, 553, 557, 559
58	*
59	*
60	549, 559
61	*
62	*
63	*
64	*
65	551, 552, 557, 559
66	*
67	*
68	*
69	*
70	*
71	*
72	*
73	571
74	590
75	590
76	*
77	*
78	*
79	541, 551
80	541, 551
81	*
82	*
83	*
84	*

DESIGNED
DPG

CHKD:
DPG

DR:
DOW

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

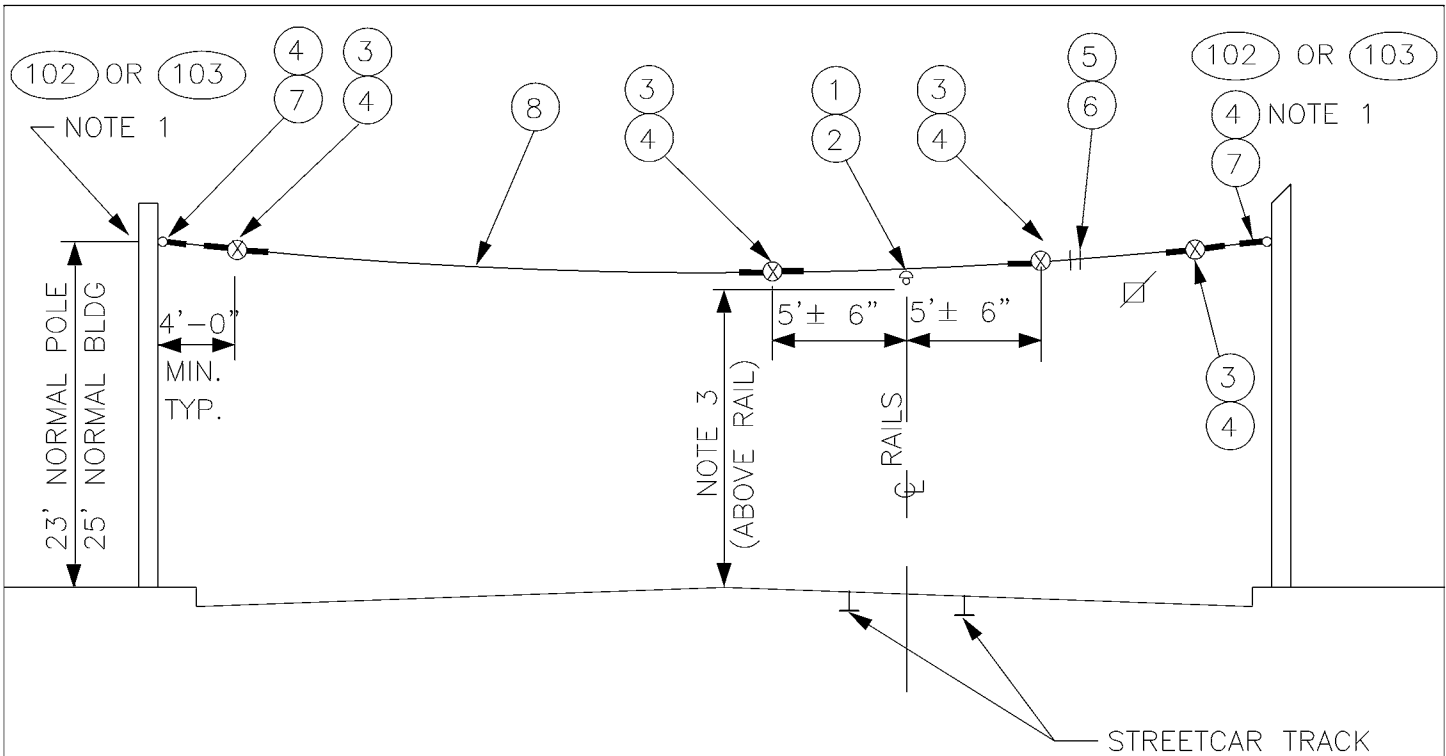
WFSC MASTER
MATERIAL LIST
USAGE REFERENCE

DATE:
FEB 98

FILE

DWG. NO.
SA-501

SHT 2 OF 3



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DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

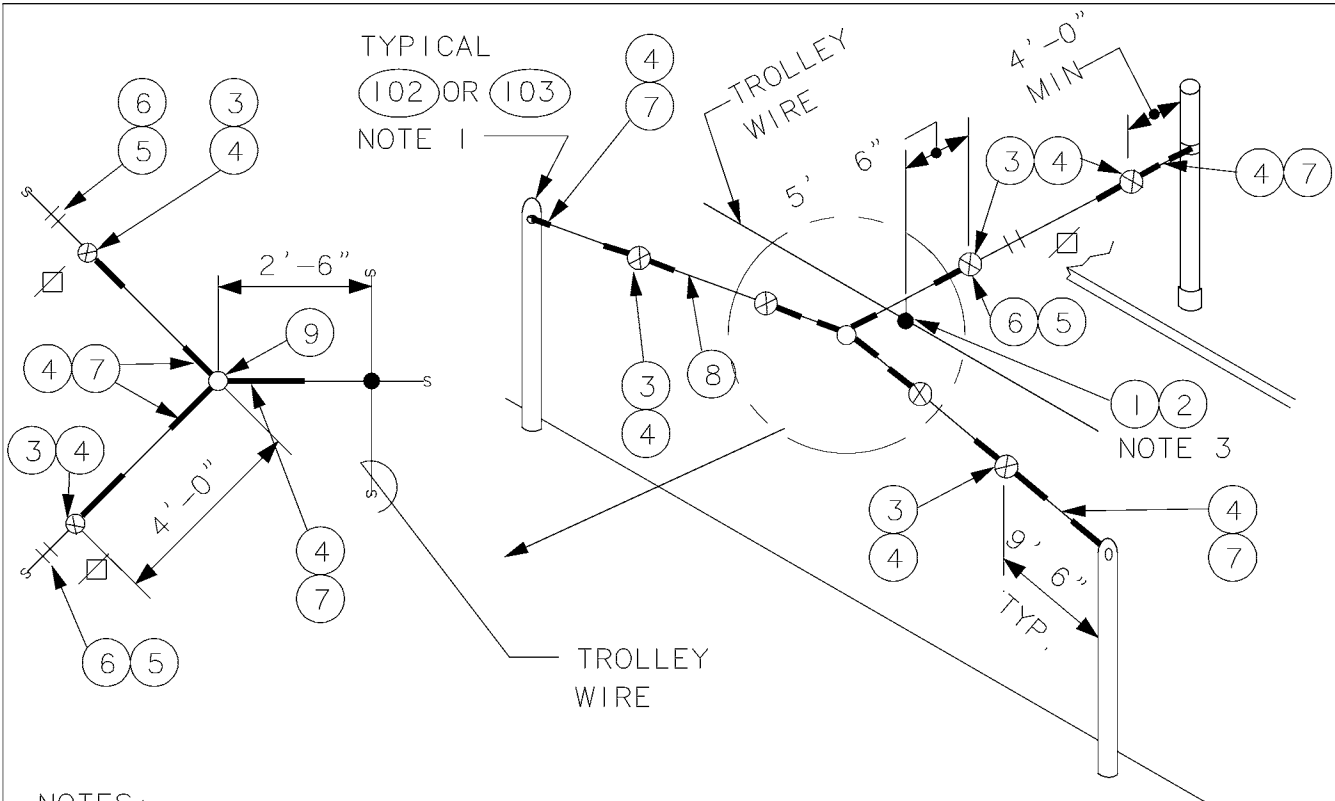
TANGENT
SPAN

DATE:
OCT 95

FILE

DWG. NO.
SA-511

SHT 1 OF 1



NOTES:

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT TO BE INDICATED AS REQUIRED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT EACH LOCATION. SEE SA-166.
3. SEE SA-164 FOR VERTICAL DIMENSION TO TROLLEY WIRE.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	1	DETROIT CLAMP ASSY	WABCO	19293-3007
02	1	AGC TANGENT SPAN HANGER	WABCO	19360-2000
03	6	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	15	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	6	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	6	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	1	BULL RING	WABCO	18567-2000
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

BRIDLE
SPAN

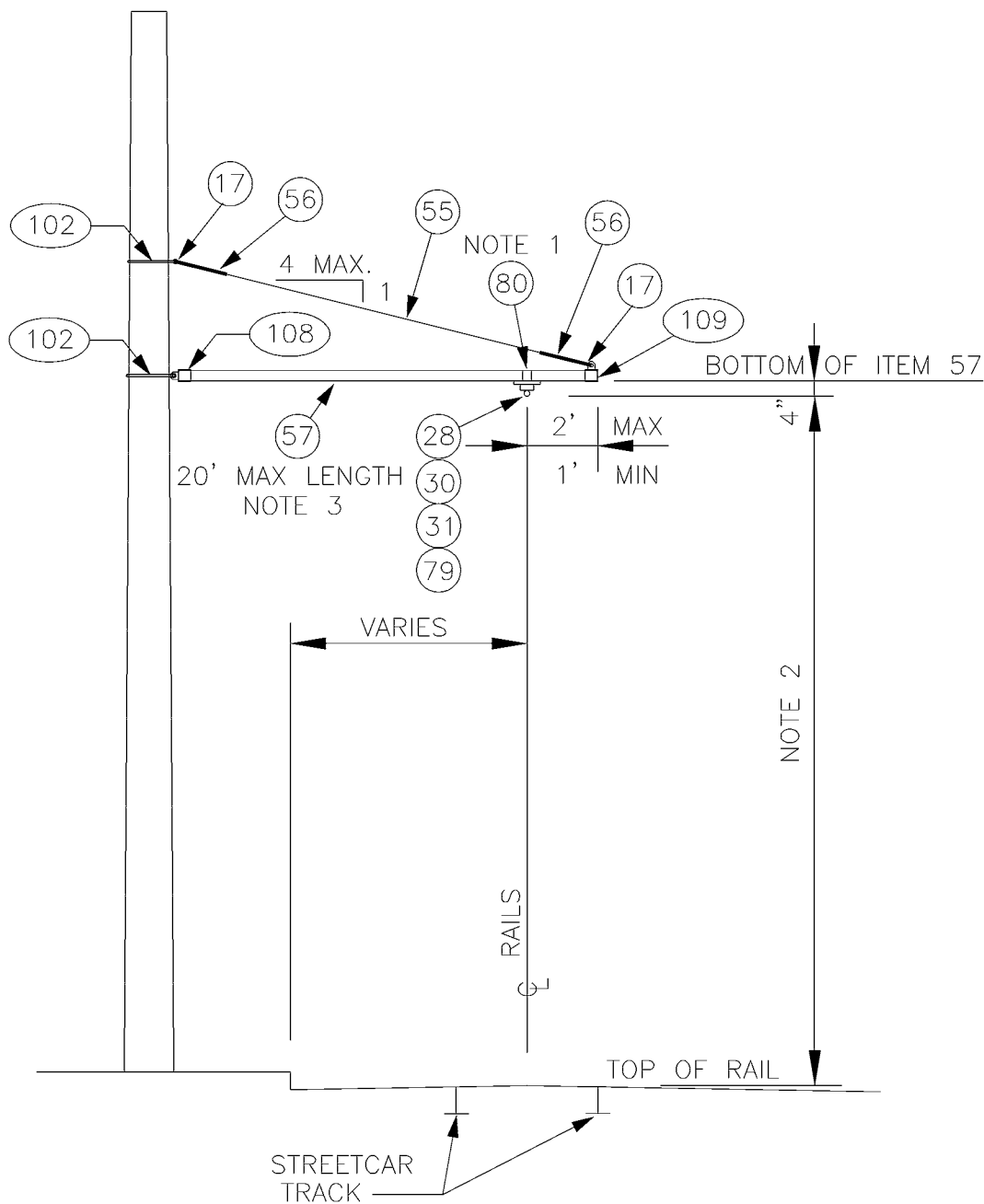
DATE:
OCT 95

FILE

DWG. NO.
SA-515


SHT 1 OF 1

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NOTES:

1. STAINLESS STEEL BANDING SHALL BE WRAPPED DOUBLE THICKNESS AROUND ITEM 57 PRIOR TO CLAMPING.
2. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR STEEL POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: JUN 95
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-541
APPROVED				SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	1	INSULATOR SPOOL	WABCO	16835-2000
30	1	TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31	1	SPRING DETROIT CLAMP	WABCO	54959-3001
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
79	1	5/8"-11 UNC X 1 3/8" STUD		
80	VARIES	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
102	2	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
109	1	MAST ARM ARM END CAP	METRO STD	SA-109

DESIGNED
DPG

DR:
DOW

RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

STEEL POLE
BRACKET ASSEMBLY
TANGENT CONSTRUCTION

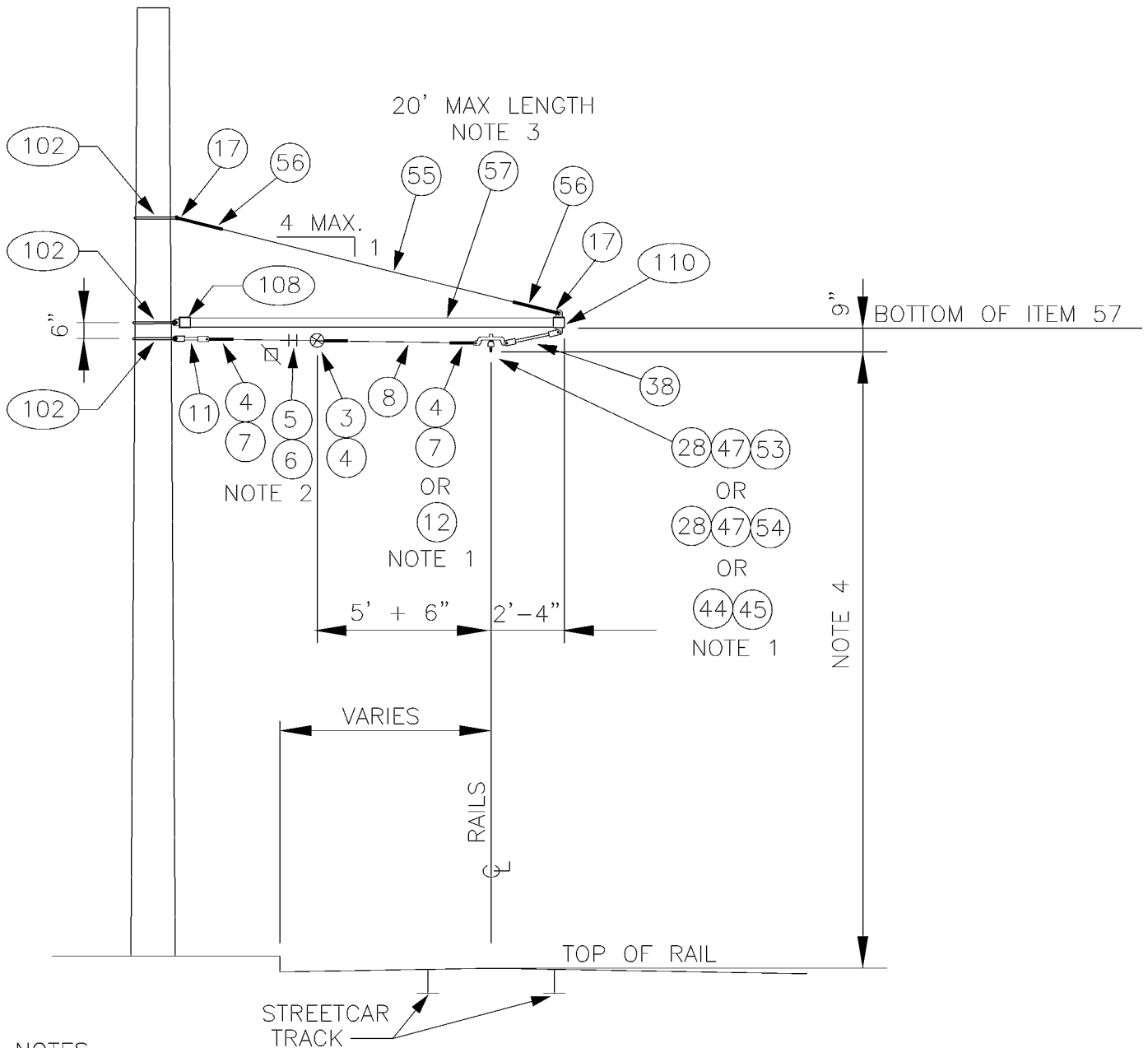
DATE:
OCT 95

FILE

DWG. NO.

SA-541

SHT 2 OF 2



NOTES:

- ITEMS 4,7,28,50 & 53 TO BE USED FOR 1° TO 5° ANGLE TURN. ITEMS 4, 7,28,47 & 54 TO BE USED FOR 5° TO 7.5° ANGLE TURN. ITEMS 12,44, & 45 TO BE USED FOR 8° OR GREATER ANGLE TURN. SEGMENTS SHALL NOT BE USED FOR ANGLES GREATER THAN 12° WHEN POLE IS ON INSIDE OF CURVE.
- PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⊠". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
- DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.
- SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR


STEEL POLE
BRACKET ASSEMBLY
CURVE CONSTRUCTION

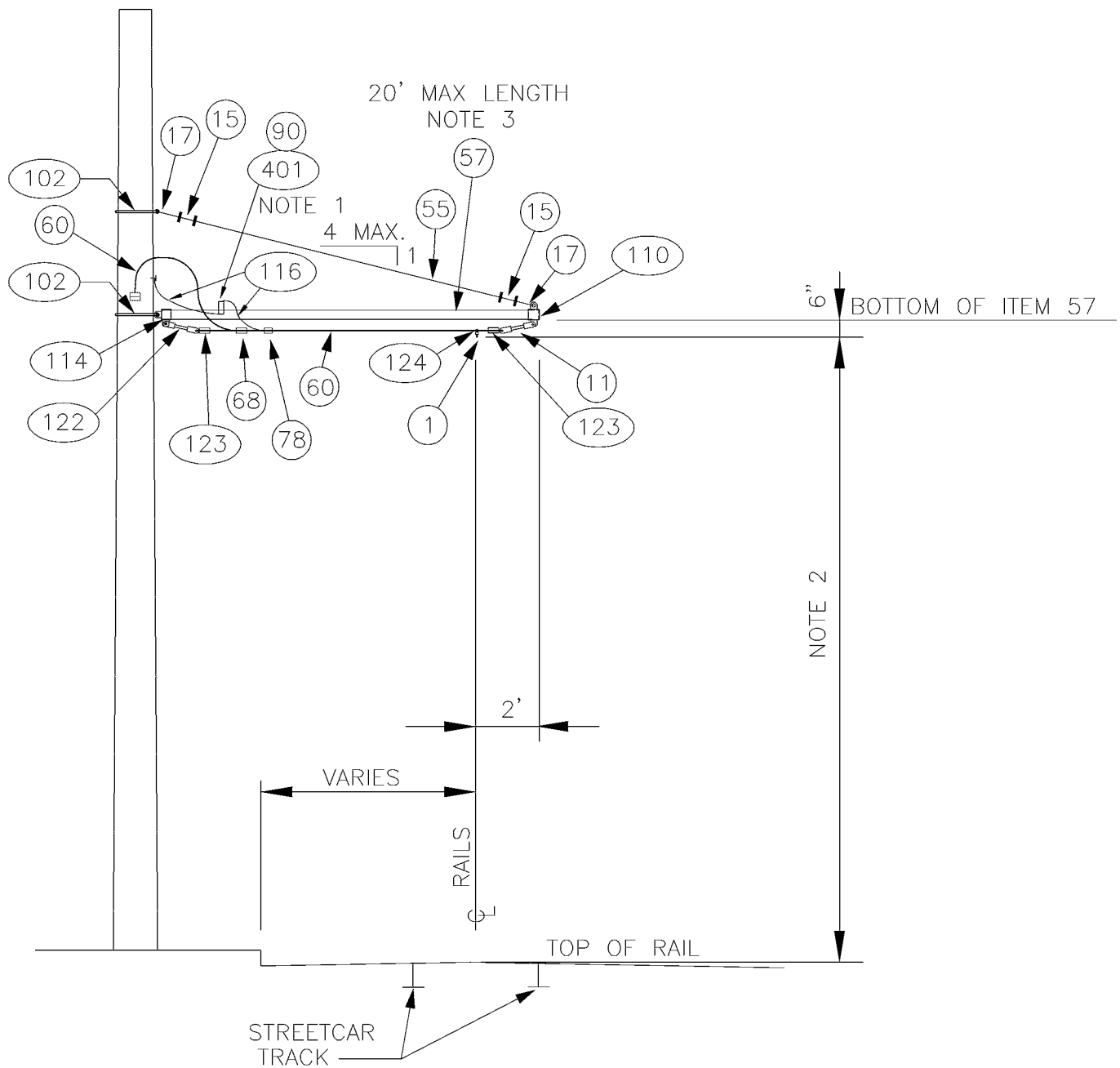
DATE:
JUN 95

FILE

DWG. NO.
SA-542

SHT 1 OF 2

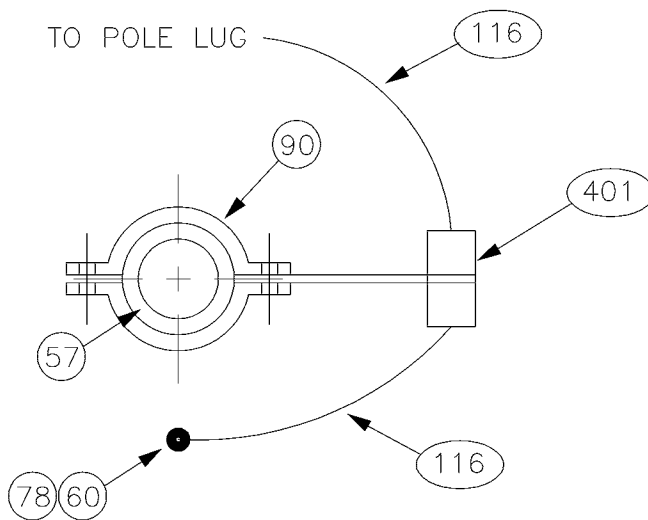
MATERIAL LIST				
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	VARIES	INSULATOR SPOOL	WABCO	16835-2000
38	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6200
44	VARIES	RUNNER, 6 FT TYPE C, 8 TO 12 DEG	WABCO	21375-2000
45	VARIES	PLATE-STRAIN 5 TO 12 DEG	WABCO	20290-2000
47	VARIES	DOUBLE CURVE HANGER TYPE A-2	WABCO	14073-2000
53	VARIES	CURVE RAIL	K & M	851 B412/0
54	VARIES	CURVE RAIL	K & M	851 B412/1
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
102	3	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
<div> <div> DESIGNED DPG </div> <div> DR: DOW </div> <div> RECOM. </div> <div> APPROVED </div> </div> <div> <div> CHKD: DPG </div> <div> SCALE: NONE </div> <div> CONTRACT: </div> </div> <div>  <div>King County</div> </div> <div> DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR STEEL POLE BRACKET ASSEMBLY CURVE CONSTRUCTION </div> <div> <div>DATE: OCT 95</div> <div>FILE</div> <div>DWG. NO. SA-542</div> <div>SHT 2 OF 2</div> </div>				



NOTES:

1. SEE DETAIL 1 ON SHEET 2 FOR DETAILS.
2. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 110 & 114 FOR INSERTION OF 3/8" SS BOLT.
4. ALL FERROUS METAL SHOULD BE HOT DIP GALV. AFTER FABRICATION.

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR	DATE: MAY 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:		STEEL POLE TANGENT FEEDER BRACKET ASSEMBLY	DWG. NO. SA-549
APPROVED				SHT 1 OF 3



DETAIL 1

LIGHTNING ARRESTOR ATTACHMENT DETAIL
INSTALL CLAMP & ARRESTOR AT TWO FEET FROM POLE

V:\Library & Standards\Standards\Trolley\Details\SA-549.1-3.dwg, SA-549.2, 1/5/2007 12:37:43 PM

DESIGNED DOW	CHKD: DPG	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR STEEL POLE TANGENT FEEDER BRACKET ASSEMBLY	DATE: MAY 98
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-549
APPROVED				SHT 2 OF 3

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	1	DETROIT CLAMP ASSY	WABCO	19293-3007
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
15	4	WIRE ROPE CLIP, 3/8"	CROSBY	G450
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
55	AS REQD	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
60	AS REQD	FEED SPAN CABLE		
68	1	UNIVERSAL SERVICE CONNECTOR	BURNDY	KVSU34
78	1	CONNECTOR, PARALLEL CLAMP	BURNDY	QPX342C
90	1	HEAVY PIPE CLAMP, GALV, 3" IPS	GRINNELL	FIG. 216
102	2	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
114	1	MAST ARM POLE END CAP W/ BOT. TAB	METRO STD	SA-114
116	VARIES	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		
122	1	7/8 TRANSLITE STRAIN INSUL CL-TB	WABCO	54982-3001
123	2	FEEDER-TYPE E DEAD END	WABCO	21590-2000
124	1	CLAMP ASSEMBLY	WABCO	54936-3006
401	1	LIGHTNING ARRESTOR	METRO STD	SA-401

DESIGNED
DOW

DR:
TMB

RECOM.

APPROVED

CHKD:
DPW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

STEEL POLE
TANGENT FEEDER
BRACKET ASSEMBLY

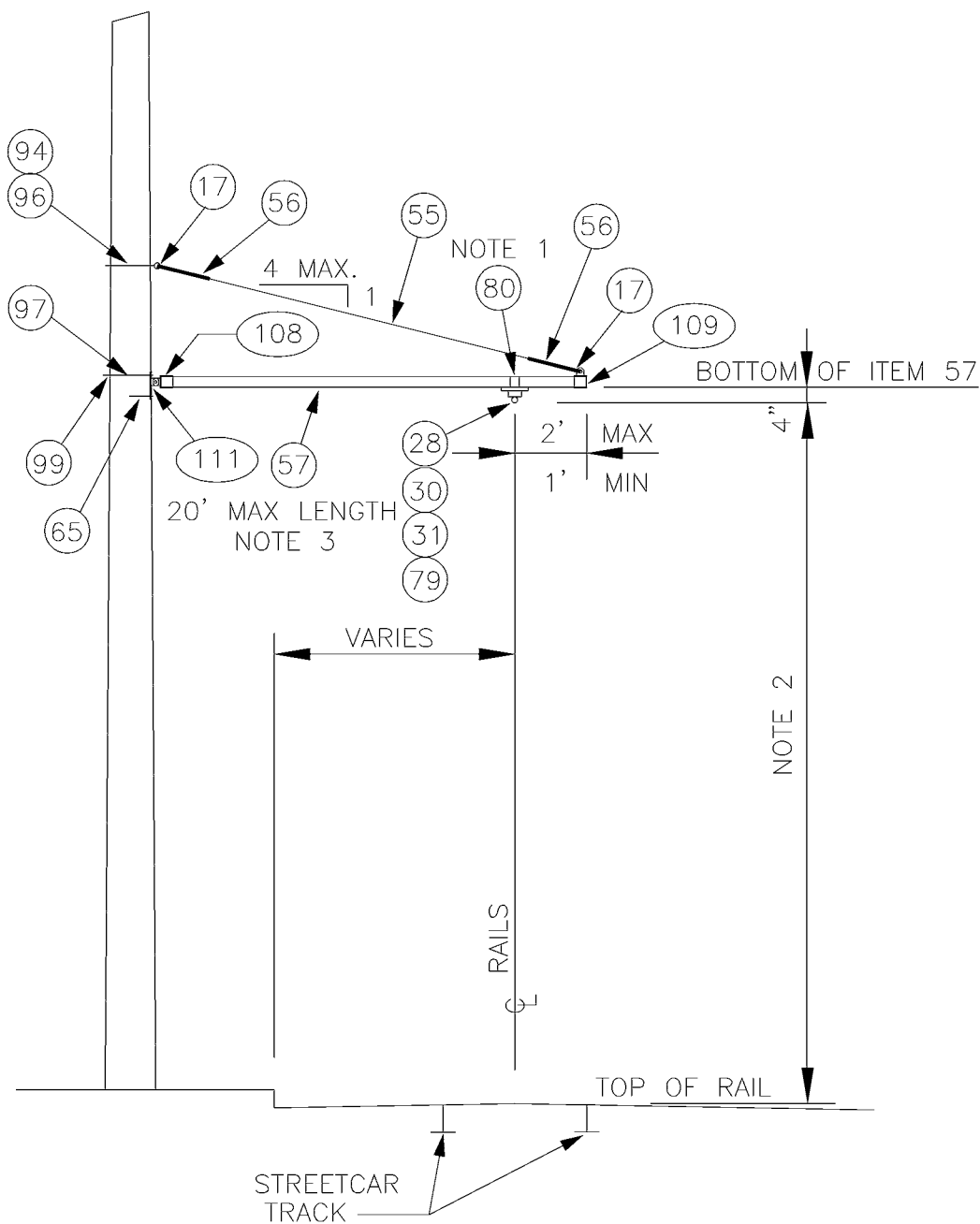
DATE:
MAY 98

FILE


DWG. NO.

SA-549

SHT 3 OF 3



NOTES:

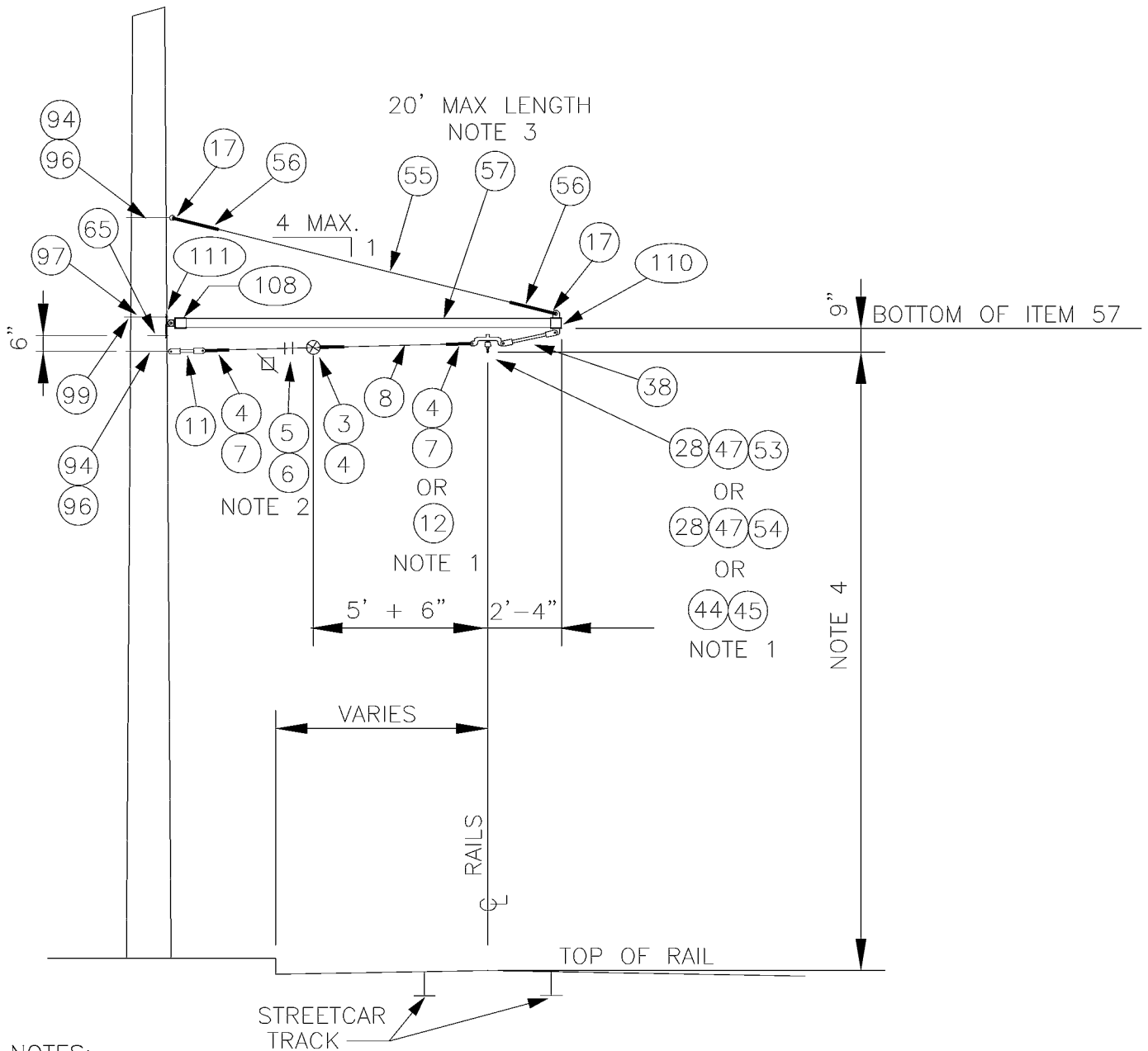
DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR	DATE: FEB 98
DR: MM	SCALE: NONE		WOOD POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	FILE
RECOM.	CONTRACT:			DWG. NO. SA-551
APPROVED				SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	1	INSULATOR SPOOL	WABCO	16835-2000
30	1	TROLLEY SUPPORT-LARGE PIPE ARMS	WABCO	54940-4001
31	1	SPRING DETROIT CLAMP	WABCO	54959-3001
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
65	1	LAG SCREW, FETTER DRIVE, 1/2" X 4"	JOSLYN	J8754
79	1	5/8"-11 UNC X 1 3/8" STUD		
80	VARIES	3/4" STAINLESS STEEL BANDING	BAND-IT	TYPE 201
94	1	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
96	1	SQ CURVED WASHER 3" X 3" X 1/4", 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	SQ CURVED WASHER 3" X 3" X 1/4", 13/16" DIA	JOSLYN	J6823
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
109	1	MAST ARM ARM END CAP	METRO STD	SA-109
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR WOOD POLE BRACKET ASSEMBLY TANGENT CONSTRUCTION	DATE: FEB 98
DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-551
APPROVED				SHT 2 OF 2



NOTES:

- ITEMS 4,7,28,50 & 53 TO BE USED FOR 1° TO 5° ANGLE TURN. ITEMS 4, 7,28,47 & 54 TO BE USED FOR 5° TO 7.5° ANGLE TURN. ITEMS 12,44, & 45 TO BE USED FOR 8° OR GREATER ANGLE TURN. SEGMENTS SHALL NOT BE USED FOR ANGLES GREATER THAN 12° WHEN POLE IS ON INSIDE OF CURVE.
- PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
- DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.
- SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

WOOD POLE
BRACKET ASSEMBLY
CURVE CONSTRUCTION

DATE:
FEB 98

FILE

DWG. NO.
SA-552

SHT 1 OF 2

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	VARIES	INSULATOR SPOOL	WABCO	16835-2000
38	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6200
44	VARIES	RUNNER, 6 FT TYPE C, 8 TO 12 DEG	WABCO	21375-2000
45	VARIES	PLATE-STRAIN 5 TO 12 DEG	WABCO	20290-2000
47	VARIES	DOUBLE CURVE HANGER TYPE A-2	WABCO	14073-2000
53	VARIES	CURVE RAIL	K & M	851 B412/0
54	VARIES	CURVE RAIL	K & M	851 B412/1
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
65	1	LAG SCREW, FETTER DRIVE, 1/2" X 4"	JOSLYN	J8754
94	2	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
96	2	SQ CURVED WASHER 3" X 3" X 1/4", 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	SQ CURVED WASHER 3" X 3" X 1/4", 13/16" DIA	JOSLYN	J6823
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

WOOD POLE
BRACKET ASSEMBLY
CURVE CONSTRUCTION

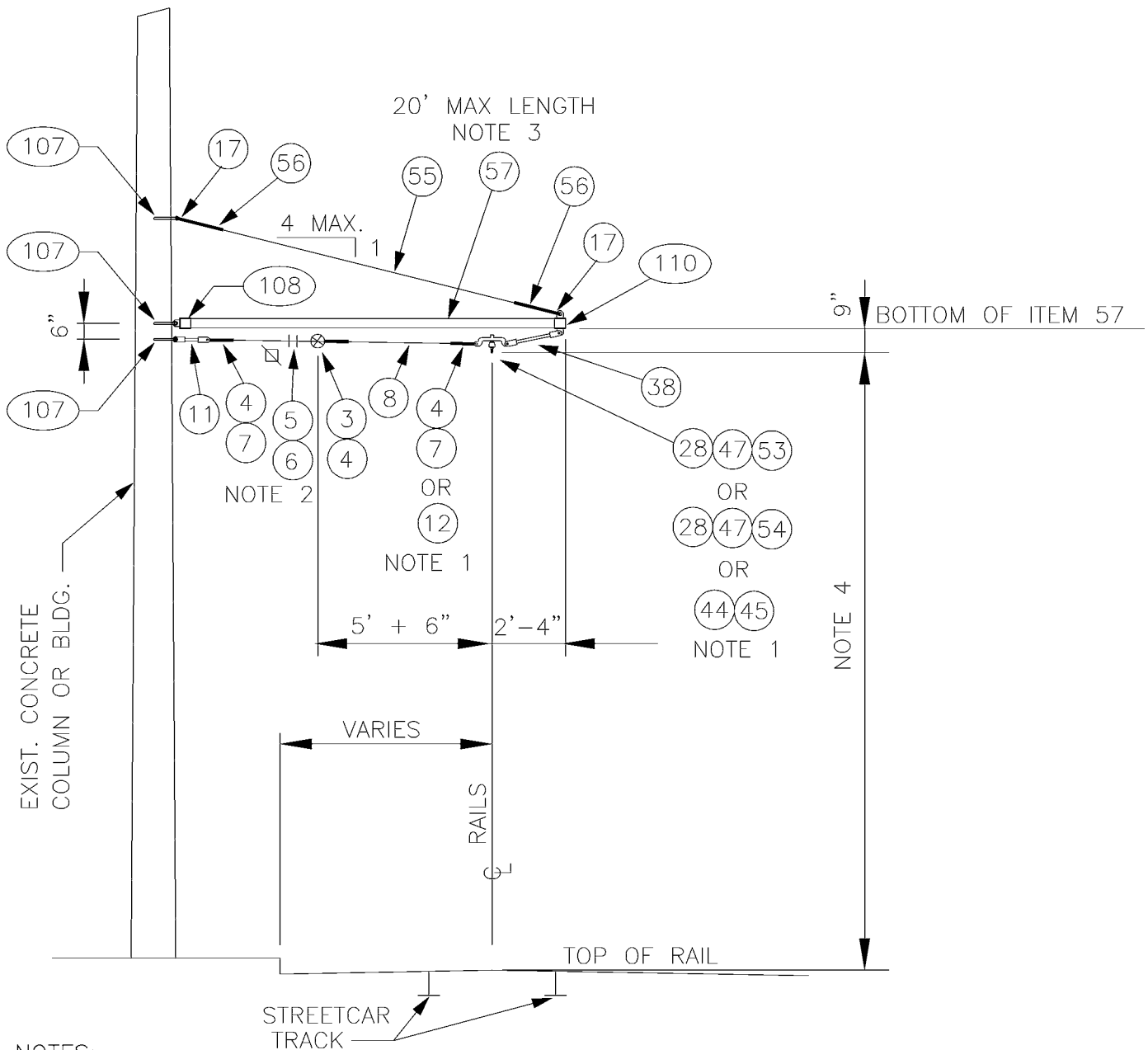
DATE:
FEB 98

FILE

DWG. NO.

SA-552

SHT 2 OF 2



NOTES:

1. ITEMS 4,7,28,50 & 53 TO BE USED FOR 1° TO 5° ANGLE TURN. ITEMS 4, 7,28,47 & 54 TO BE USED FOR 5° TO 7.5° ANGLE TURN. ITEMS 12,44, & 45 TO BE USED FOR 8° OR GREATER ANGLE TURN. SEGMENTS SHALL NOT BE USED FOR ANGLES GREATER THAN 12° WHEN POLE IS ON INSIDE OF CURVE.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⊠". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.
4. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.

DESIGNED
DPG

DR:
MM

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

CONCRETE ATTACHMENT
BRACKET ASSEMBLY
CURVE CONSTRUCTION

DATE:
JUN 95

FILE

DWG. NO.
SA-553

SHT 1 OF 2


MATERIAL LIST

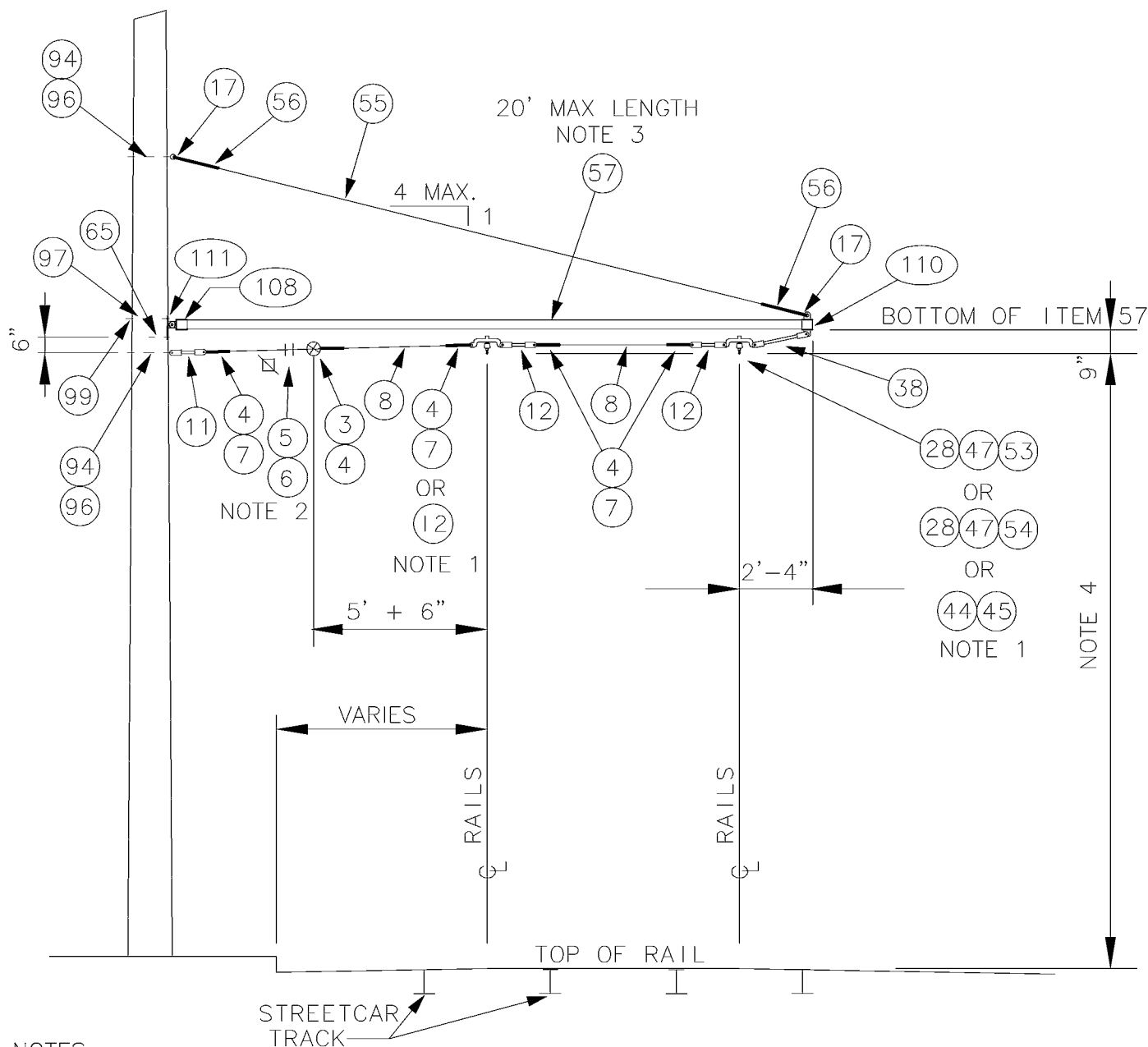
ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	VARIES	INSULATOR SPOOL	WABCO	16835-2000
38	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6200
44	VARIES	RUNNER, 6 FT TYPE C, 8 TO 12 DEG	WABCO	21375-2000
45	VARIES	PLATE-STRAIN 5 TO 12 DEG	WABCO	20290-2000
47	VARIES	DOUBLE CURVE HANGER TYPE A-2	WABCO	14073-2000
53	VARIES	CURVE RAIL	K & M	851 B412/0
54	VARIES	CURVE RAIL	K & M	851 B412/1
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
107	3	STAINLESS STEEL EYEBOLT	METRO STD	SA-107
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110

NOTES:

1. INSTALL ITEM 107 PER SA-221.

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR CONCRETE ATTACHMENT BRACKET ASSEMBLY CURVE CONSTRUCTION	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-553
APPROVED				SHT 2 OF 2



1. ITEMS 4,7,28,50 & 53 TO BE USED FOR 1 TO 5 ANGLE TURN. ITEMS 4, 7,28,47 & 54 TO BE USED FOR 5 TO 7.5 ANGLE TURN. ITEMS 12,44, & 45 TO BE USED FOR 8 OR GREATER ANGLE TURN. SEGMENTS SHALL NOT BE USED FOR ANGLES GREATER THAN 12 WHEN POLE IS ON INSIDE OF CURVE.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT THESE LOCATIONS. SEE SA-166.
3. DRILL 1/2" HOLE IN TUBE TO MATCH HOLE IN ITEMS 108 & 109 FOR INSERTION OF 3/8" SS BOLT.
4. SEE SA-164 FOR HORIZONTAL & VERTICAL DIMENSIONS TO TROLLEY WIRE.

CHKD:	DOW
SCALE:	NONE
CONTRACT:	



King County

WOOD POLE
BRACKET ASSEMBLY
CURVE CONST (2 TRACKS)

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	VARIES	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	2	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	VARIES	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
12	VARIES	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
28	VARIES	INSULATOR SPOOL	WABCO	16835-2000
38	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6200
44	VARIES	RUNNER, 6 FT TYPE C, 8 TO 12 DEG	WABCO	21375-2000
45	VARIES	PLATE-STRAIN 5 TO 12 DEG	WABCO	20290-2000
47	VARIES	DOUBLE CURVE HANGER TYPE A-2	WABCO	14073-2000
53	VARIES	CURVE RAIL	K & M	851 B412/0
54	VARIES	CURVE RAIL	K & M	851 B412/1
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
65	1	LAG SCREW, FETTER DRIVE, 1/2" X 4"	JOSLYN	J8754
94	2	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
96	2	SQ CURVED WASHER 3" X 3" X 1/4", 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	SQ CURVED WASHER 3" X 3" X 1/4", 13/16" DIA	JOSLYN	J6823
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

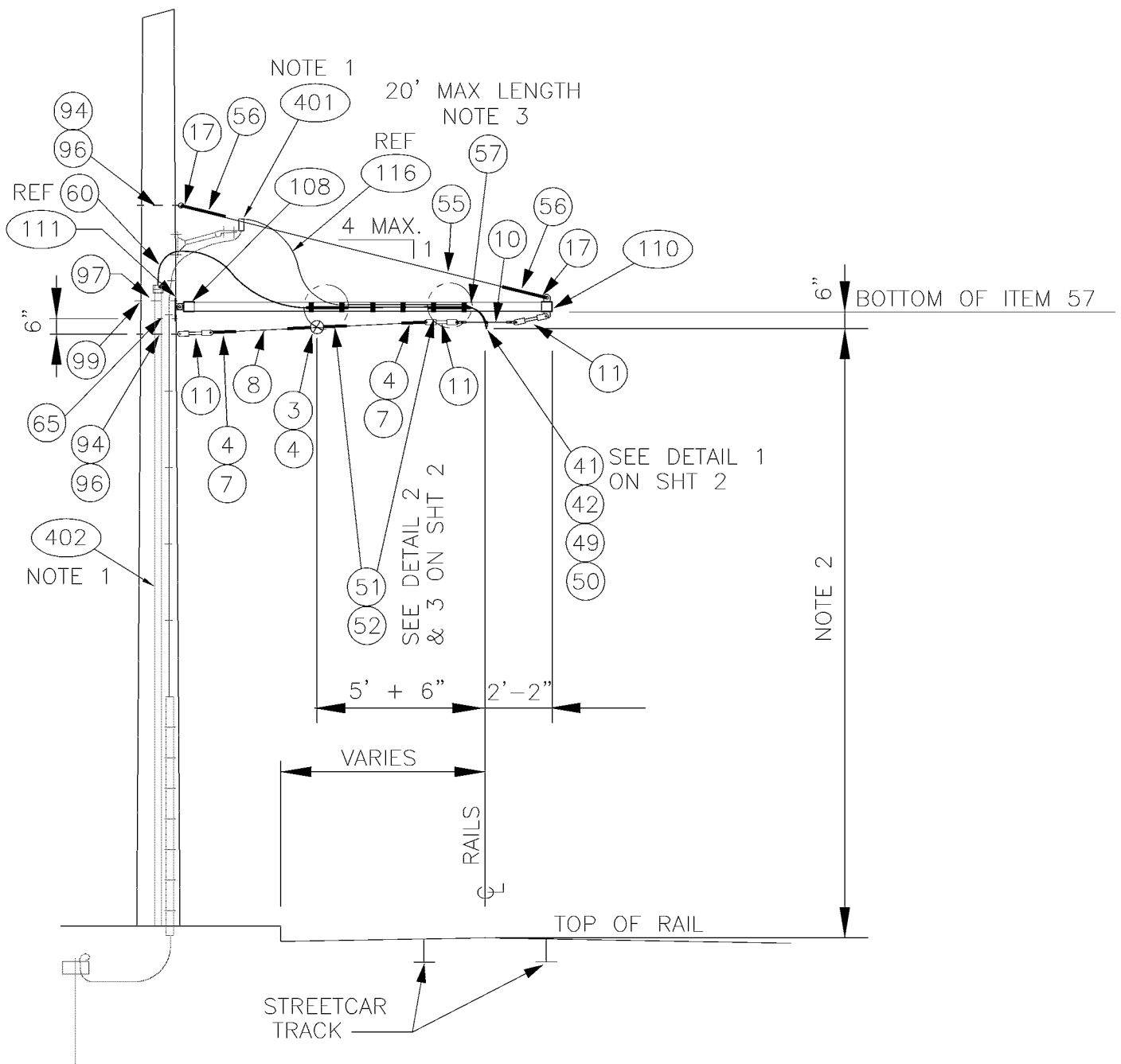
WOOD POLE
BRACKET ASSEMBLY
CURVE CONST (2 TRACKS)

DATE:
JUN 95

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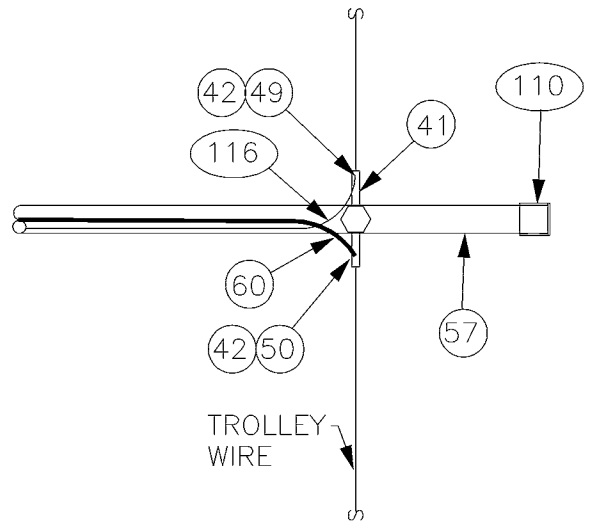
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SA-557

SHT 2 OF 2

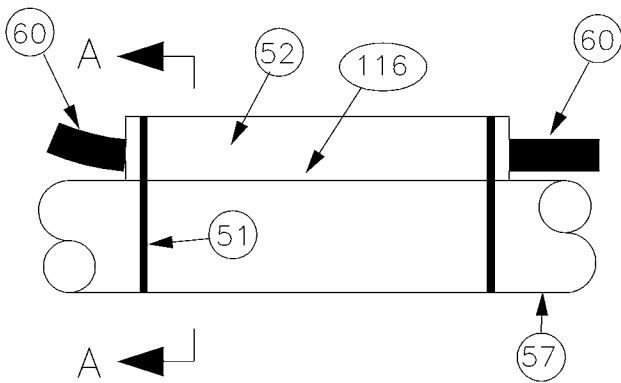


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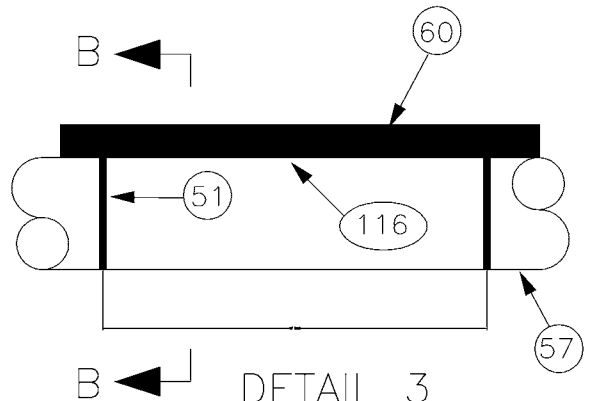
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DR: MM	SCALE: NONE			FILE
RECOM.	CONTRACT:		WOOD POLE TANGENT FEEDER	DWG. NO. SA-559
APPROVED			BRACKET ASSEMBLY	SHT 1 OF 3



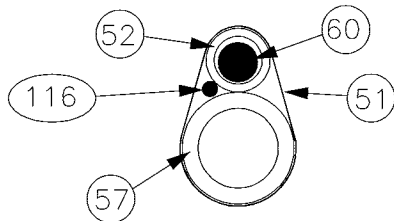
DETAIL 1
POSITIVE FEEDER



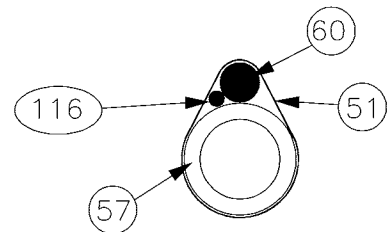
DETAIL 2



DETAIL 3



VIEW A-A
POSITIVE FEEDER



VIEW B-B
POSITIVE FEEDER

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DESIGNED
DOW

DR:
TMB

RECOM.

APPROVED

CHKD:
DPG

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

WOOD POLE
TANGENT FEEDER
BRACKET ASSEMBLY

DATE:

APR 95

FILE

DWG. NO.

SA-559

SHT 2 OF 3

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	1	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	4	GUY GRIP DEADEND	PREFORMED	CDE-3106
07	2	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
10	1	HI-LITE DOUBLE CURVE HANGER	WABCO	54962-3001
11	3	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
41	1	H. S. FEEDER CLAMP ASSY, BRONZE	WABCO	19879-2000
42	2	FEEDER CLAMP, BRONZE	WABCO	21088-2000
49	1	COMPRESSION CONNECTOR COPPER-LONG BARREL-TIN PLATED-FLARED	ANDERSON/SQUARE D	VHCL-2/0-12BNF
50	1	COMPRESSION CONNECTOR COPPER-LONG BARREL-TIN PLATED-FLARED	ANDERSON/SQUARE D	VHCL-500-12BNF
51	AS REQD	MULTI-LOK TIES (18") NYLON COATED	BAND-IT	AE714
52	2 12" PIECES	TUF NEOPRENE AIR HOSE SLEEVE 1.5" ID X 2.0625" OD (BLACK)	MCMASTER-CARR	3 BRAID
55	VARIES	PHILLYSTRAN (3/8")	PHILLYSTRAN INC.	HPTG 6700I
56	2	PHILLYSTRAN BIG GRIP	PHILLYSTRAN INC.	PLP 2755
57	VARIES	FIBERGLASS REINFORCED PLASTIC (FRP) TUBE 3 1/2" Ø X 1/2"	MORRISON MOLDED FG	EXTREN SERIES 525
60	AS REQD	FEED SPAN CABLE		
65	1	LAG SCREW, FETTER DRIVE, 1/2" X 4"	JOSLYN	J8754
94	2	5/8" OVAL EYEBOLT W/ NUT	JOSLYN	J94XX
96	2	SQ CURVED WASHER 3" X 3" X 1/4", 11/16" DIA	JOSLYN	J113
97	1	3/4" MACHINE BOLT	JOSLYN	J89XX
99	1	SQ CURVED WASHER 3" X 3" X 1/4", 13/16" DIA	JOSLYN	J6823
108	1	MAST ARM POLE END CAP	METRO STD	SA-108
110	1	MAST ARM UNDERSLING END CAP	METRO STD	SA-110
111	1	WOOD POLE MOUNTING BRACKET	METRO STD	SA-111
116	VARIES	WIRE, 2 OR 5 KV, #4 AWG CU, JACKETED, UNSHIELDED		

DESIGNED
DOW

DR:
TMB

RECOM.

APPROVED

CHKD:
DPW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

WOOD POLE
TANGENT FEEDER
BRACKET ASSEMBLY

DATE:
OCT 95

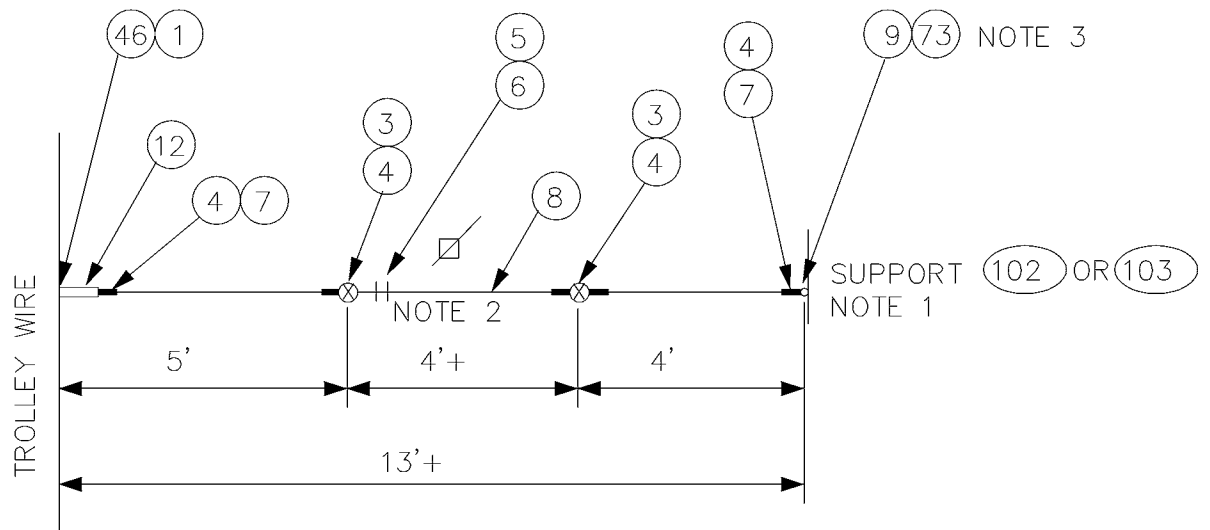
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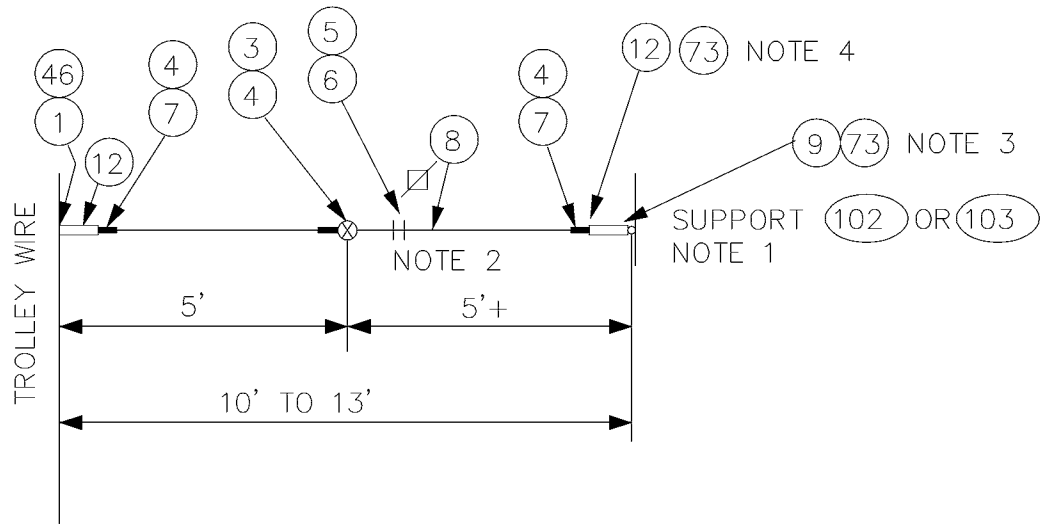
SA-559

SHT 3 OF 3

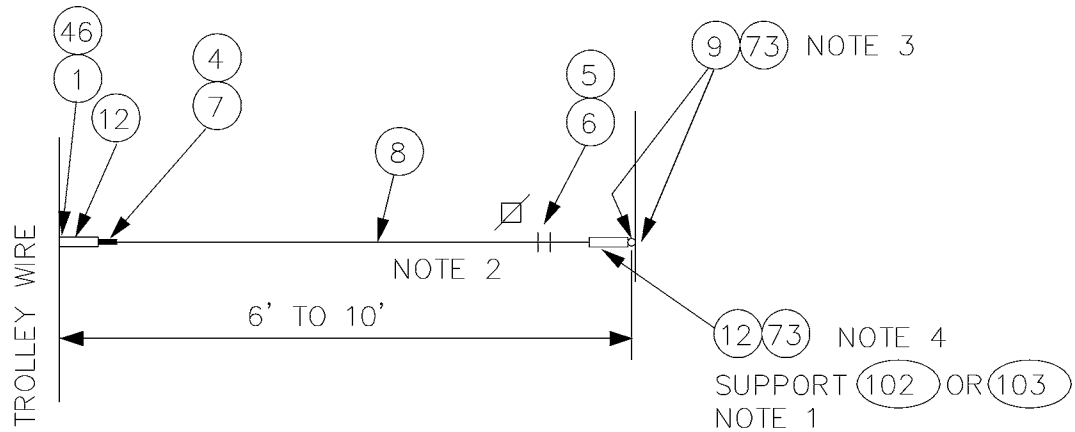
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B



C



DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

SPECIALWORK
PULLOFF

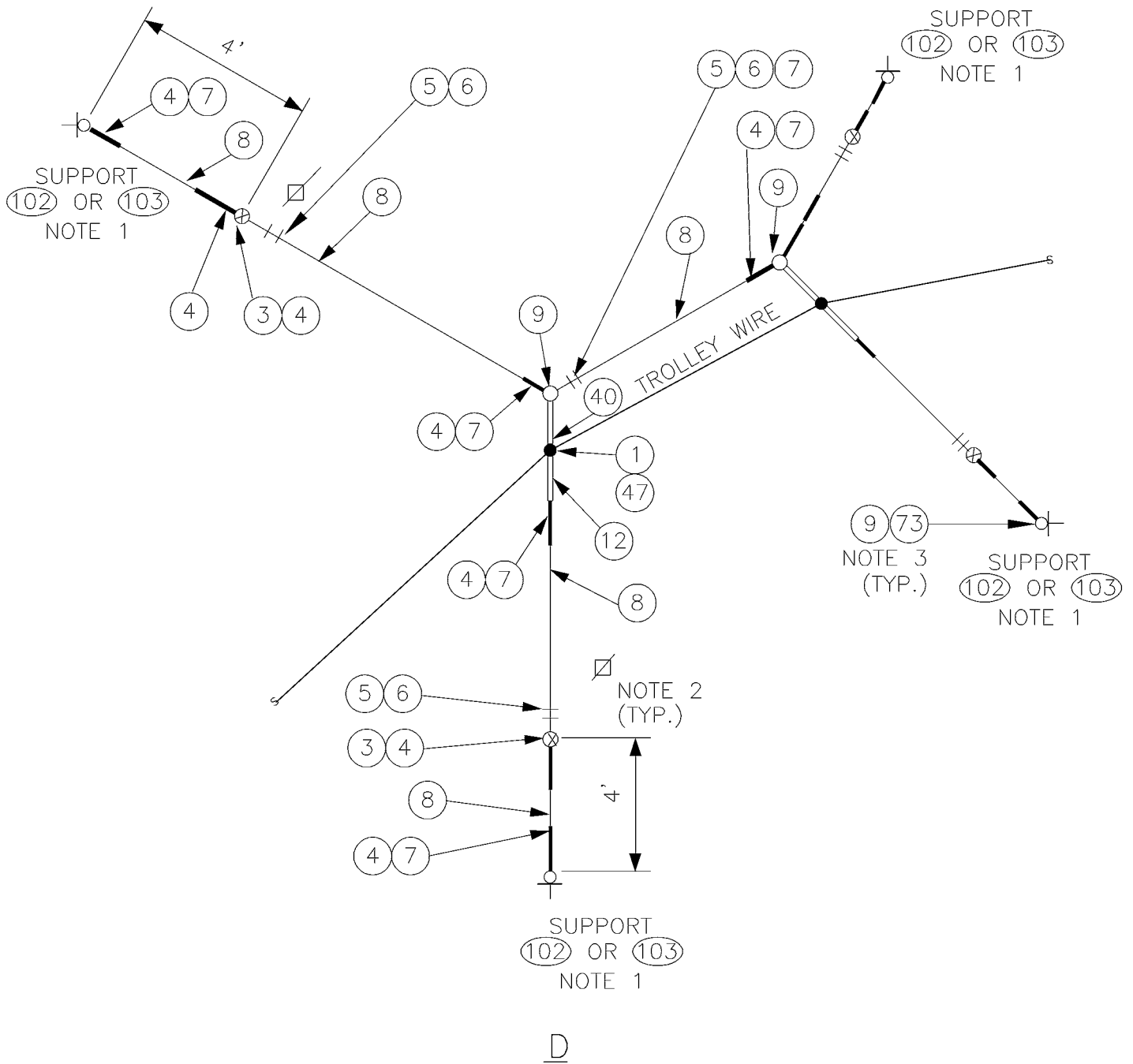
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JUN 95

FILE

DWG. NO.

SA-571

SHT 1 OF 5



DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

SPECIALWORK
PULLOFF

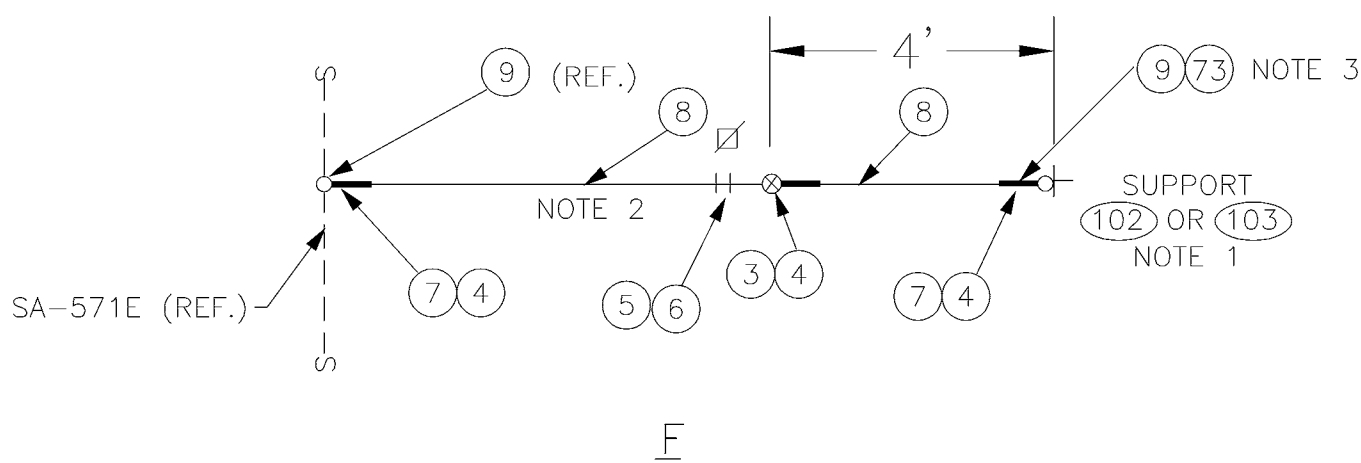
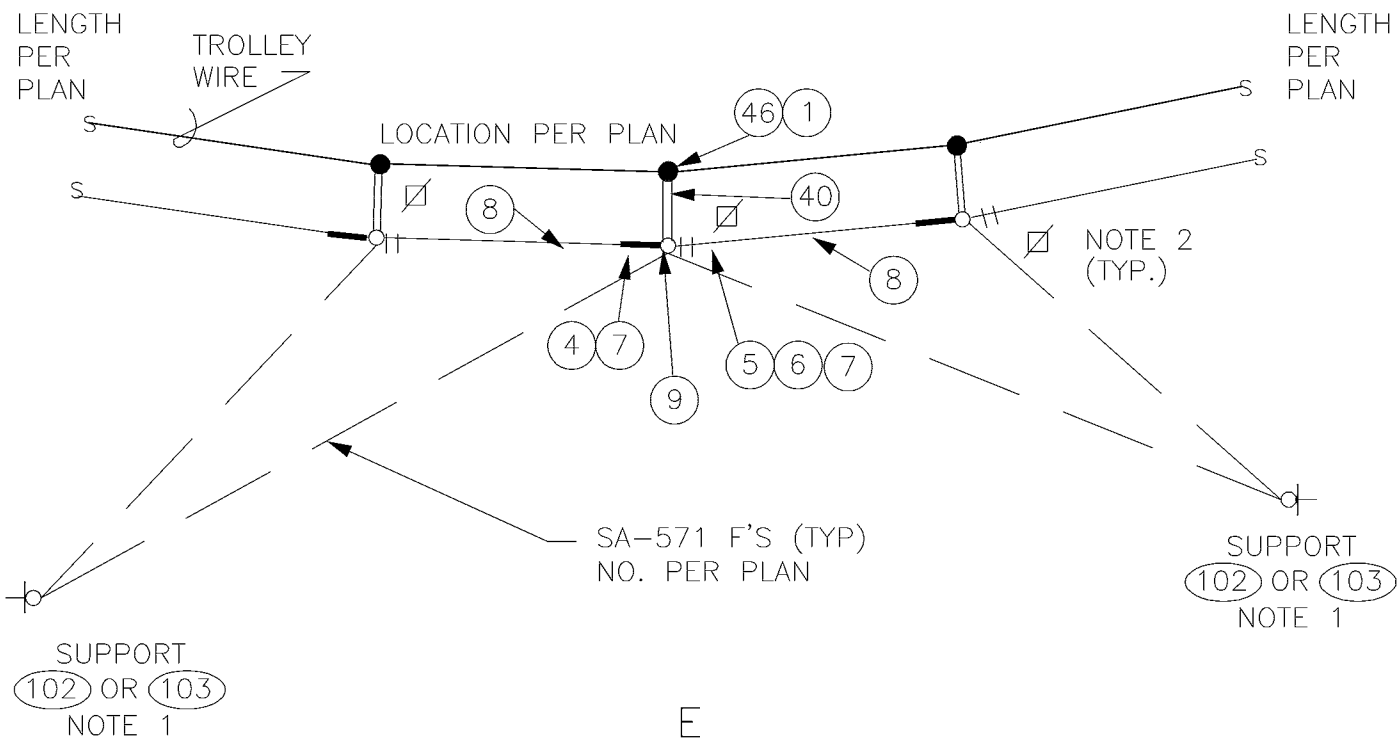
DATE:
JUN 95

FILE

DWG. NO.

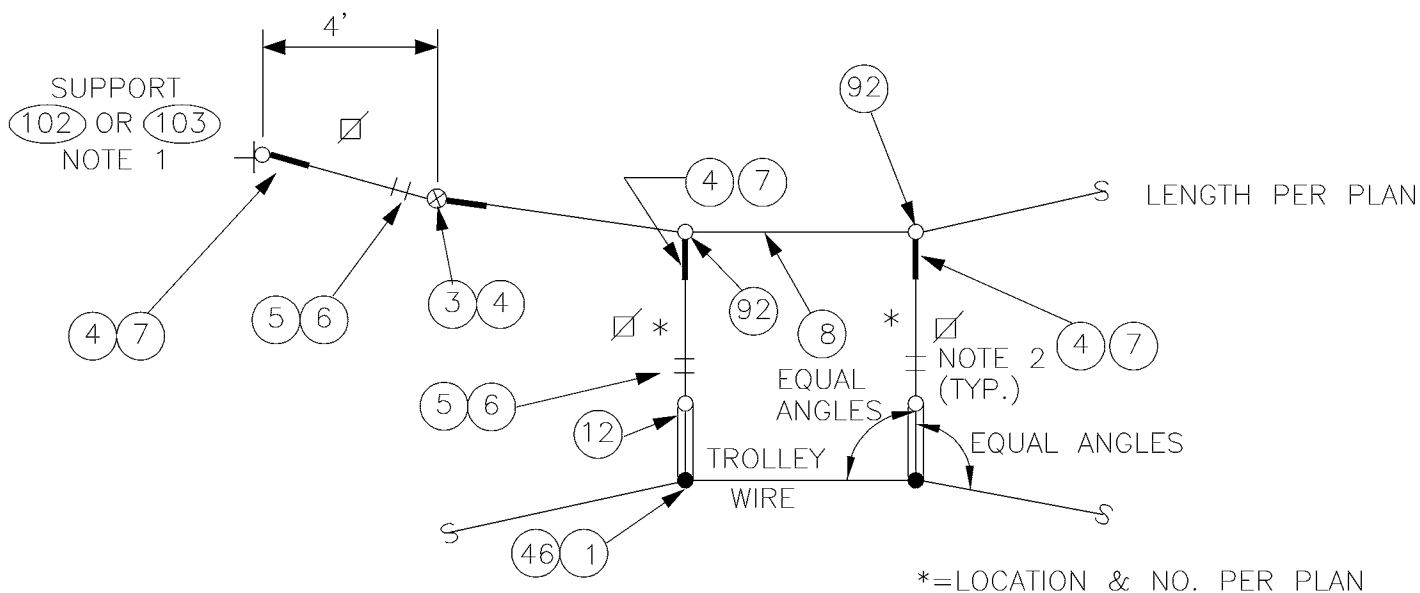
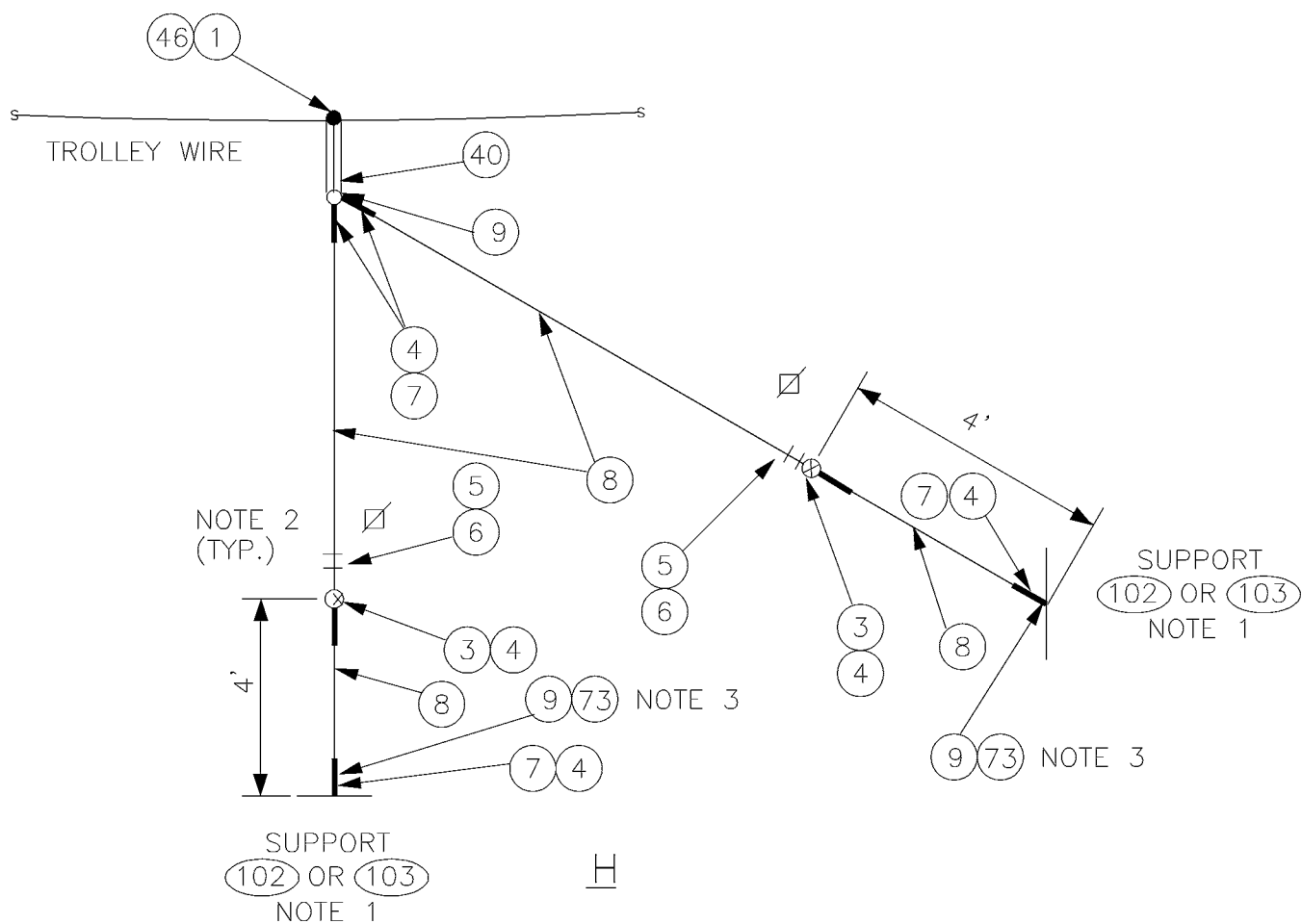
SA-571

SHT 2 OF 5



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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR SPECIALWORK PULLOFFS	DATE: JUN 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-571
APPROVED				SHT 3 OF 5

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DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR		DATE: OCT 95
DR: TMB	SCALE: NONE		SPECIALWORK PULLOFF		FILE
RECOM.	CONTRACT:				DWG. NO. SA-571
APPROVED					SHT 4 OF 5

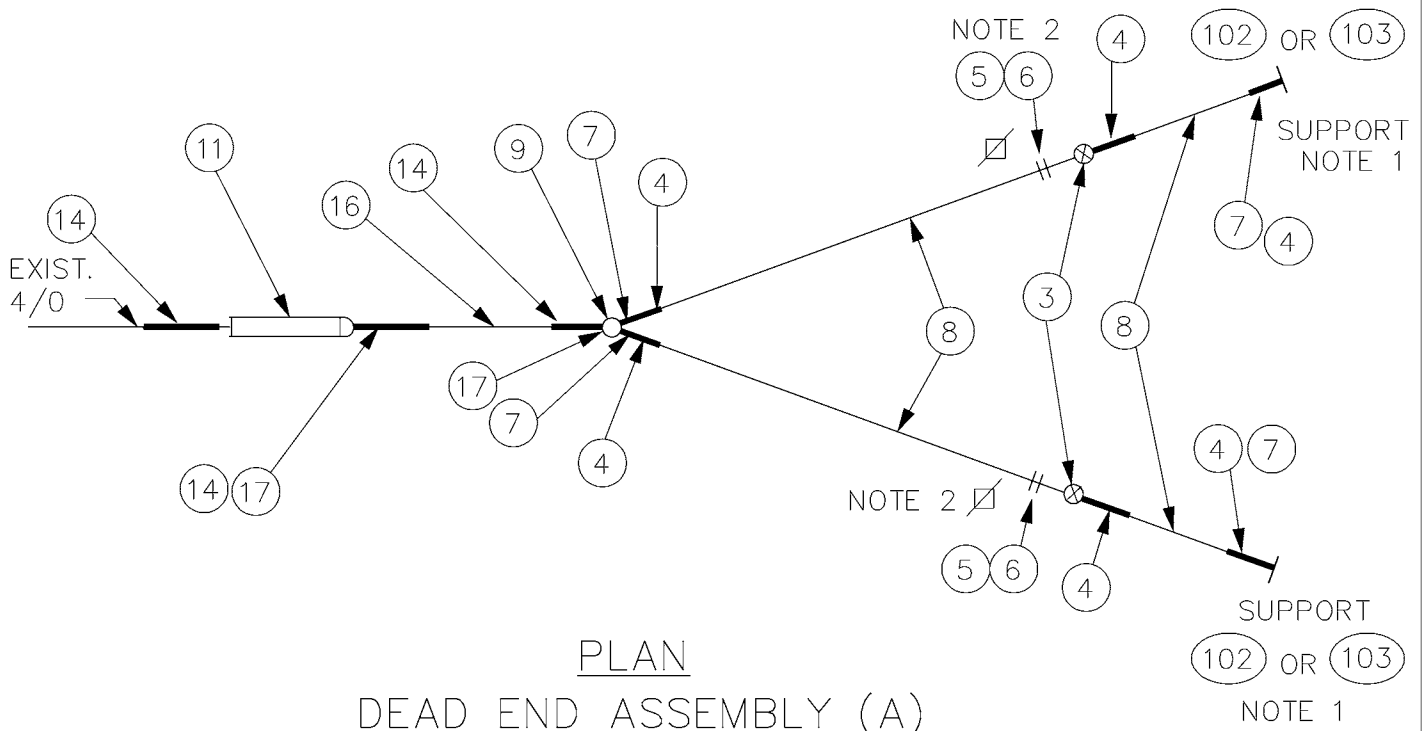
NOTES:

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT TO BE INDICATED AS REQUIRED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "X". PROVIDE WIRE ROPE CLIPS AT EACH LOCATION. SEE SA-166.
3. ITEMS 9 & 73 REQUIRED WHEN MORE THAN TWO PULLOFFS AND/OR SPANS ATTACH TO SAME SUPPORT.
4. ITEM 73 REQUIRED WITH ITEM 12 IF SUPPORT IS AN EYEBOLT.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
09	*	BULL RING	WABCO	18567-2000
12	*	7/8 TRANSLITE STRAIN INSUL CL-EYE	WABCO	55339-6120
40	*	7/8 TRANSLITE STRAIN INSUL CL-90	WABCO	54995-6120
GUY TENSIONS----- 0-3000 LBS				
01	*	DETROIT CLAMP ASSY	WABCO	19293-3007
03	*	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	*	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	*	WIRE ROPE CLIP, 5/16"	CROSBY	G450
07	*	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
46	*	SINGLE CURVE HANGER TYPE A-2	WABCO	14072-2000
47	*	DOUBLE CURVE HANGER TYPE A-2	WABCO	14073-2000
73	*	ANCHOR SHACKLE	JOSLYN	J2742
92	*	ANGLE CLAMP	ANDERSON/ SQUARE D	82860-2000
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR SPECIALWORK PULLOFF	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-571
APPROVED				SHT 5 OF 5



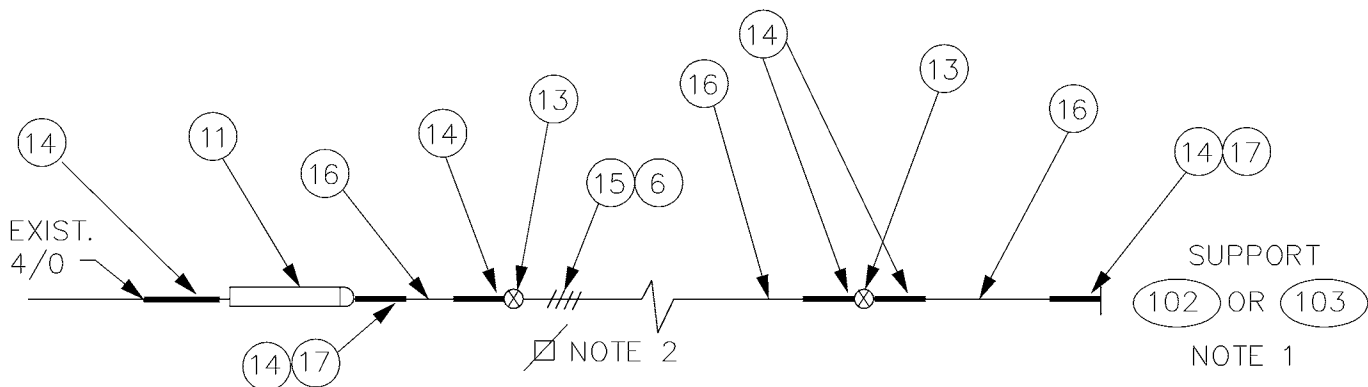
NOTES

- 1 . A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
- 2 . PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "⊠". SEE SA-166.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
03	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	504
04	6	GUY GRIP DEADEND	PREFORMED	CDE-3106
05	4	WIRE ROPE CLIP, 5/16"	CROSBY	G450
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
07	4	THIMBLE, 3/8" XHD, OPEN	CROSBY	G414
08	VARIES	GUY STRAND	COPPERWELD	8M
09	1	BULL RING	WABCO	18567-2000
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
14	3	GUY GRIP DEADEND	PREFORMED	CDE-3115
16	VARIES	GUY STRAND	COPPERWELD	16M
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED DPG	CHKD: DOW	 King County	DEPARTMENT OF TRANSPORTATION WATERFRONT STREETCAR DEAD END ASSEMBLY	DATE: OCT 95
DR: TMB	SCALE: NONE			FILE
RECOM.	CONTRACT:			DWG. NO. SA-572
APPROVED				SHT 1 OF 2



PLAN DEAD END ASSEMBLY (B)

NOTES

1. A POLE COLLAR OR POLE EYEBOLT IS REQUIRED PER SA-102 OR SA-103 UNLESS A BUILDING EYEBOLT ATTACHMENT IS USED. INSTALLATION HEIGHT IS INDICATED ON THE OVERHEAD DRAWINGS.
2. PROVIDE TENSION ADJUSTMENT POINTS AT LOCATIONS INDICATED BY "☒". SEE SA-166.

MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
06	AS REQD	FRICTION TAPE, 3/4" (6 WRAPS)		
11	1	7/8 TRANSLITE STRAIN INSUL CL-CL	WABCO	54975-6120
13	2	GUY STRAIN INSUL	PORCELAIN PRODUCTS CO.	506
14	6	GUY GRIP DEADEND	PREFORMED	CDE-3115
15	4	WIRE ROPE CLIP, 3/8"	CROSBY	G450
16	VARIES	GUY STRAND	COPPERWELD	16M
17	2	THIMBLE, 1/2" XHD, OPEN	CROSBY	G414
102	VARIES	FORGED THREE-PIECE ADJUSTABLE POLE BAND, ANNEALED & GALVANIZED	KORTICK MFG CO	
103	VARIES	WOOD POLE EYEBOLT	METRO STD	SA-103

DESIGNED
DPG

DR:
TMB

RECOM.

APPROVED

CHKD:
DOW

SCALE:
NONE

CONTRACT:



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

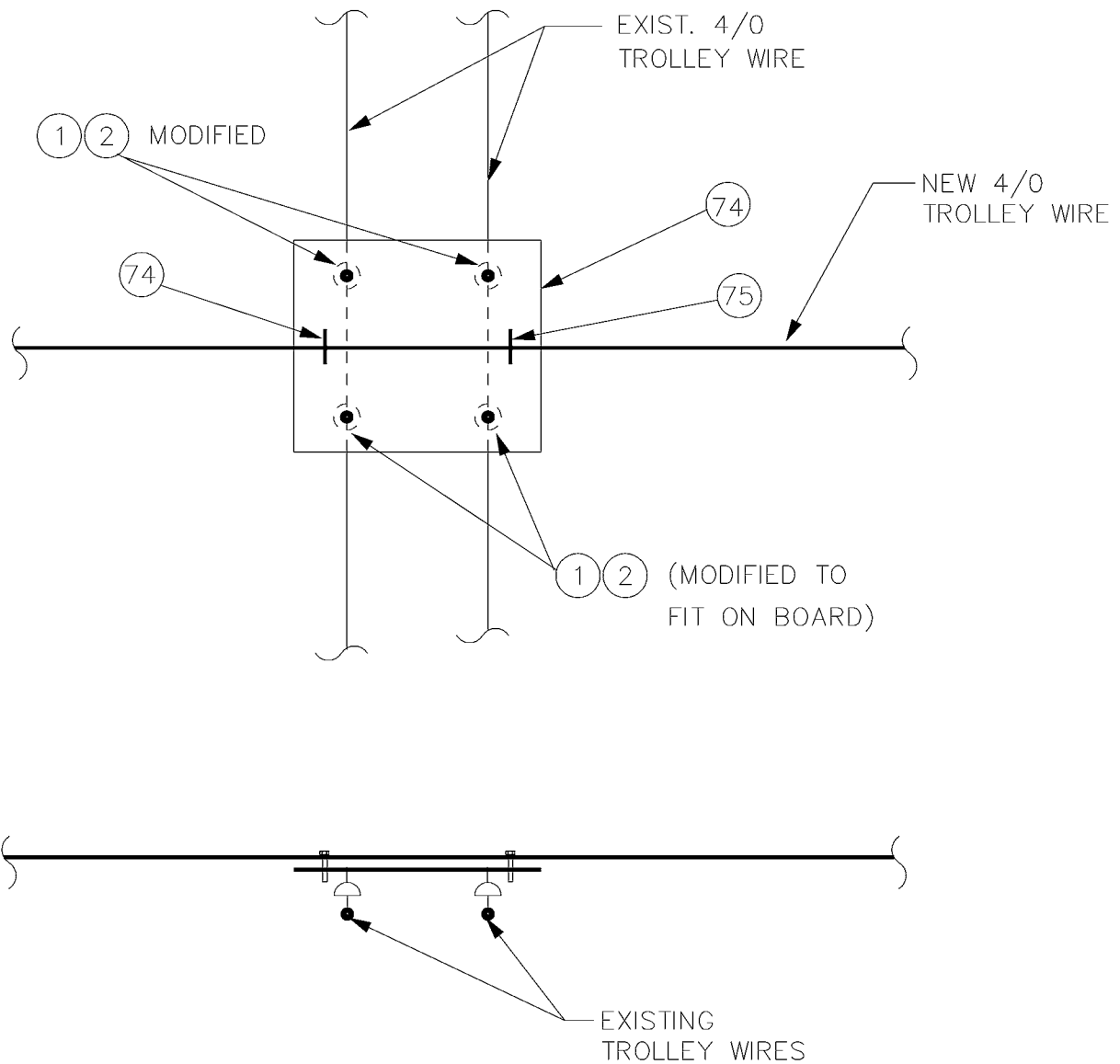
DEAD END
ASSEMBLY

DATE:
OCT 95

FILE

DWG. NO.
SA-572

SHT 2 OF 2



MATERIAL LIST

ITEM #	QTY	DESCRIPTION	MANUFACTURER	CAT. NO.
01	4	DETROIT CLAMP ASSY	WABCO	19293-3007
02	4	AGC TANGENT SPAN HANGER	WABCO	19360-2000
74	1	4 X 4 X 1/2" EXTERIOR PLYWOOD		
75	4	U BOLT, FOR 4/0 TROLLEY WIRE		

DESIGNED
DPG

CHKD:
DOW

DR:
TMB

SCALE:
NONE

RECOM.

CONTRACT:

APPROVED



King County

DEPARTMENT OF TRANSPORTATION
WATERFRONT STREETCAR

TEMPORARY
INSULATION
BOARD

DATE:
JUN 95

FILE

DWG. NO.

SA-590

SHT 1 OF 1